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Commercial and Industrial Notes on Shensi

Sanitation in Hongkong and Shanghai

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COMMERCE :-: ENGINEERING :-: FINANCE

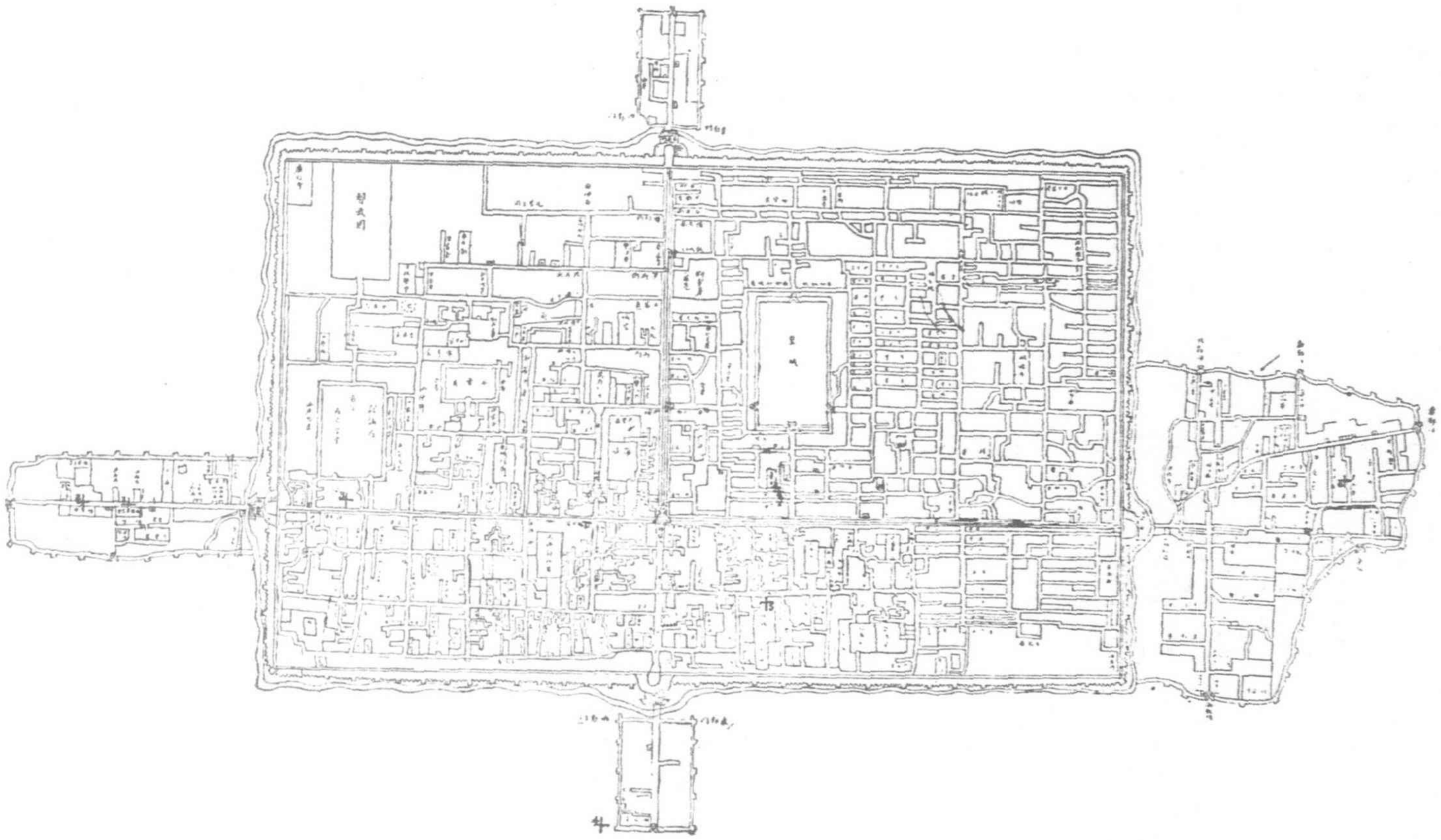
VOL. XI. SHANGHAI AND MANILA, OCTOBER, 1914 No. 5

COMMERCIAL AND INDUSTRIAL NOTES ON SHENSI

BY CONSUL C. L. L. WILLIAMS, DALNY (DAIREN), JAPANESE LEASED TERRITORY.

Shensi, one of the 18 Provinces of China proper, occupies an area of about 75,270 square miles in the northwestern part of the Republic. It supports an estimated population of 8,500,000, of which number the greater part live in the southeastern portion of the Province, where are practically all of the important cities, including Sianfu, the capital, which the writer visited last November.

Owing to its geographical isolation, Shensi remains one of the least-known Provinces of China proper. For imports there are three trade routes in general use: (*a*) Up the Han River from Hankow to Loahokow, thence via a small tributary of the Han to Lungchutsai, thence by pack mule over the hills to Sian; (*b*) from Honanfu (Loyang) via Tungkuan to Sian by pack mule or cart; and (*c*) from Taiyuanfu in Shensi by pack mule via Tungkuan or Tungchow. The route by the Han River takes about two months from Hankow. It is said that the freight works out by this route at about 3 tael cents per catty from Hankow to Sian, or say, roughly, $33 U. S. per ton (varying with exchange). Owing however, to the time consumed in transport and to the fact that only goods which can be packed by mule can be handled, this route is not popular.

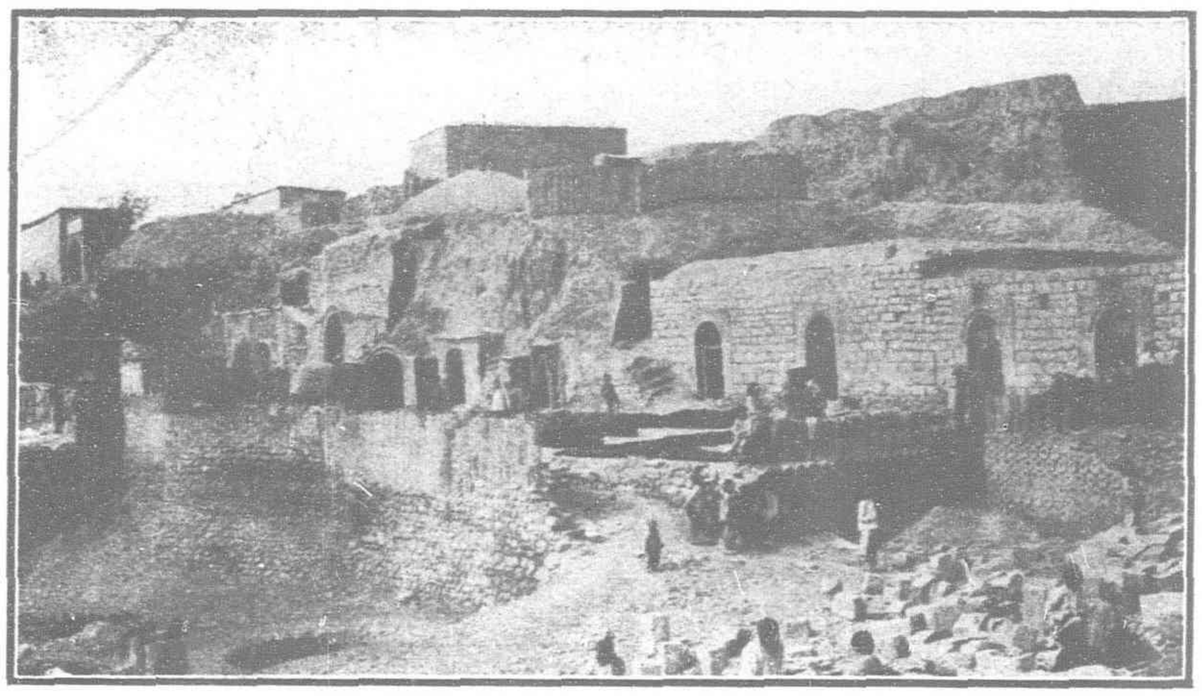


SIAN, CAPITAL OF SHENSI.

ROUTE TO SIAN MOST USED—FREIGHT RATES

The usual route is that by Tungkuan from Honanfu. To reach Honanfu goods travel from Hankow to Chengchow by the Peking-Hankow Railway, thence to Honanfu by the Pienlo Railway. The trip overland to Sian takes 8 to 12 days or longer, depending on the state of the roads, the distance being about 275 miles.

There are three methods of transport—by country cart, passenger cart, and pack mule. A country cart carries from 1,000 to 2,000 pounds in weight, a passenger cart up to about 1,000 pounds, and a pack mule about 350 pounds. Prices vary greatly according to the state of the roads. Under good conditions a country cart moderately laden costs about $22 U. S. currency per trip, passenger cart, $11, and a pack mule $5. During the rainy season the roads are impassable for any kind of cart, and are difficult even for pack mules. At such times the prices charged for transport advance enormously. The postal service contracts for a yearly daily service by pack mule between Honanfu and Sian at $37.50 U. S. currency per ton, nearly $0.14 per ton or per mile.



Chinese Pottery.

The routes from Taiyuan to Sian are seldom used since the advent of the railway to Honanfu.

INTRODUCTION OF FOREIGN WARES.

Despite these handicaps considerable quantities of foreign goods find their way into Shensi. Kerosene, selling at approximately $3.50 U. S. per case of 10 gallons; cigarettes, candles, cotton piece goods and yarn, woolen goods, artificial indigo, and printing paper, in addition to a great variety of small sundries, are commonly seen in transport or on sale in the principal cities. Sewing machines of American origin are in very general use among tailors and in the better-class homes.

There are two methods in vogue of introducing foreign goods into the interior; one may sell them at a treaty port, such as Shanghai or Hankow, to a Chinese dealer, who sells them in turn to his connections in the provinces, or one may market direct through native selling agents at the principal interior marts. The former method is used with cotton and woolen goods, indigo, paper, some other staples, and with sundries, while the latter is in general use for the sale of kerosene, cigarettes, and sewing machines. Where the latter system is used the selling companies generally employ foreign inspectors, who travel continually, each throughout his own district, conducting advertising campaigns, reporting on local conditions, and supervising the business of the native selling agents. As foreign firms are precluded by treaty arrangements from establishing branch houses outside the treaty ports, until this restriction is removed it would seem that the native selling agent offers the best solution of the problem of conducting business in the interior.

CROPS OF THE PROVINCE—MULE BREEDING.

Although a fertile farming country, Shensi, in recent years, has had only one staple of export, opium. As in other provinces, the cultivation of the poppy has now been officially prohibited. Reports as to the effectiveness of this prohibition vary with the district from which they come, with the opportunities of the observer, and with his bias on the opium question. They generally concur, however, in stating that a considerable acreage formerly put to opium has recently been put to other crops. Opium is a very valuable crop, and the suppression of its cultivation will doubtless work a very real, if temporary, hardship to the farmer, who can not replace it with anything else from the standpoint of returns per acre. The comparative sparseness of the population will prevent this problem from becoming an acute one in Shensi. The authorities are exerting themselves to popularize the silk and cotton industries as an alternative means of support for those who have depended on opium.

Other staple crops in the province are cotton, millet, maize, kaoliang or tall millet, buckwheat, wheat, beans and persimmons and some other varieties of fruit. Near Tungkuan, in the eastern extremity, of the Province, rice is not infrequently seen. A very small percentage of the agricultural produce of the Province is exported. The rarity of serious floods render conditions more favorable for farming than in many other parts of China. Drought is the greatest danger, but it is now nearly 12 years since there has been acute suffering on this account. There exists a considerable opportunity for colonization in the northern part of the Province, of which many natives of Shantuug Province have been availing themselves.

Shensi is known over the whole of North China for its splendid mules; these are bred by peasant farmers. Mules bring from $110 U. S. currency upward, and are largely exported from Shensi to other Provinces.

HAICHOW-LANCHOW RAILWAY.

The most important public work now in hand is the railway from Honanfu to Lanchow in Kansu, via Sian, traversing Shensi from east to west. Honanfu is now the western terminus of the Pien-lo Railway, which crosses the Peking-Hankow line at Chengchow and has its present eastern terminus at Kaifengfu, the Capital of Honan. It is planned to extend the line, however, to Haichow, a seaport on the coast of Kiangsu. Work is actively proceeding on the section between Honanfu and Tungkuan, the line being open for traffic as far as Tiehmen, some 45 miles from Honanfu and 230 miles from Sian. When completed this railway will solve the transportation problem, now the greatest hindrance to foreign trade in Shensi. It is hoped that traffic may be running to Tungkuan in two years and to Sianfu in three. The construction work is being undertaken by a Belgian syndicate for the Chinese Government, under the supervision of inspecting engineers appointed by the latter.

MODERNIZING THE TARTAR QUARTER OF SIAN.

During the revolutionary disturbances the Tartar quarter, which was situated in the northeastern part of Sian and occupied about one-fourth of its total area, was completely burned to the ground, the only structure left standing after the fire being the massive walls of a ruined palace inclosure. The provincial authorities are now planning to rebuild this part of Sian on modern lines. A commencement has been made by pulling down the southern wall of the old Tartar city, converting it into a broad thoroughfare, and lining the street so made with 2-story shop buildings. To the foreign observer these appear to be of extremely flimsy construction, but they compare favorably, nevertheless, with buildings used for similar purposes in other parts of the city. The work of construction has been carried on at Government expense, the aim of the authorities being to popularize the quarter by renting the newly erected shops to the public at a nominal figure. It is reported that the Government intends to build offices for the provincial administration on this new road, and a new post-office building, on foreign lines, is already in course of construction there.

Owing to the expense of hauling road-making material and the difficulty of transporting the necessary machinery, it is doubtful if the macadamization of the city streets, as has been suggested, is now feasible. With the facilities that will be available after the advent of the railway, this proposel should present no serious difficulties, however. All the principal streets are at present paved with huge stone blocks in the approved Chinese fashion, which, while well adapted to the heavy, 2-wheeled Chinese carts, are impossible for any modern vehicle. A drainage system will be a necessary corollary to the building of modern roads. A rough survey of the city, showing levels, has already been made in anticipation of some such scheme of reconstruction.

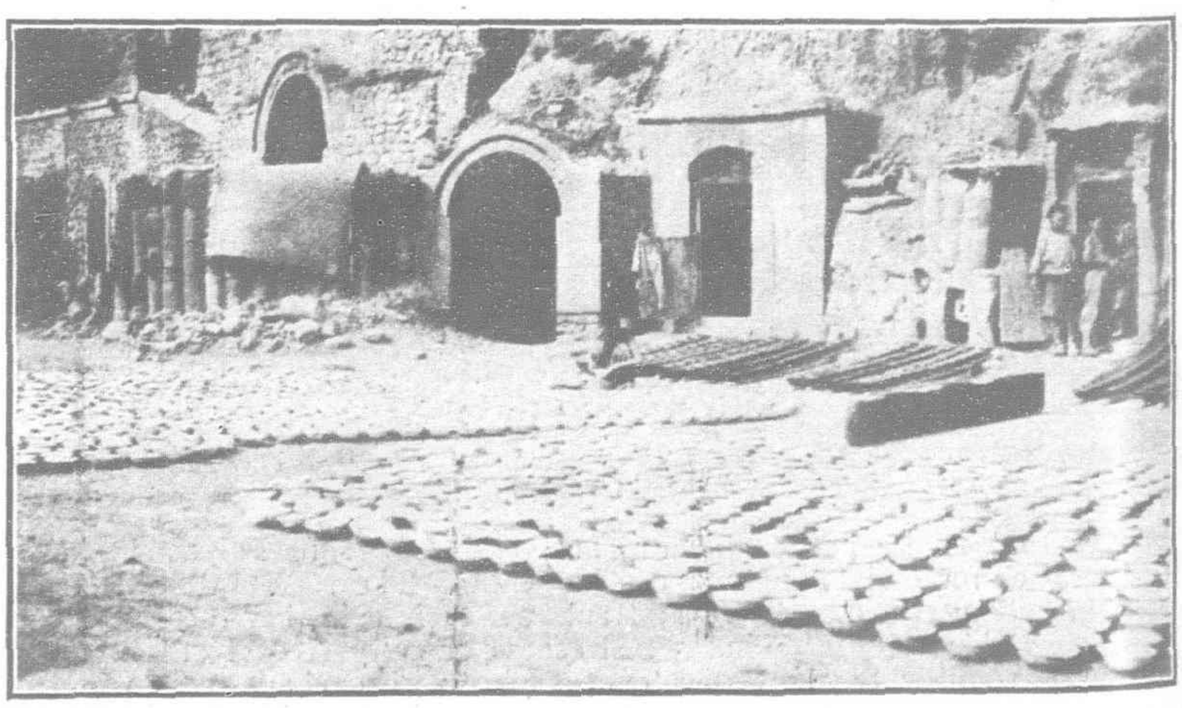
PROVINCIAL INDUSTRIAL EXPOSITION.

In celebration of the second anniversary of the Republic, there was held in Sian a provincial industrial exposition. The recently erected store buildings on the new road, to which reference has been made, provided excellent accommodations for the exhibits. The general scheme was that each political district (hsien or county) should equip a stall with exhibits exemplifying its principal products. There were also special booths for various industrial institutes, for important companies, for certain trades, and for the modern schools. While very small and imperfect if judged from a western standpoint, the exhibition was nevertheless most interesting and instructive, and as a result of its popularity is to be made an annual event. On this occasion exhibits were limited to products of the Province, but it is hoped that later foreign firms will be permited to participate; as the exhibition was popular with the Chinese, a stall should prove a cheap and profitable advertising medium. Among the interesting displays were the stalls of the silk and cotton trades, the exhibits from the copper mines at Chennanhsien, and from the oil wells at Yench'anghsien.

The most popular feature with Chinese visitors was the exhibition of work done in the modern schools. Drawings (taken from foreign copy books, among which were several portraits of George Washington), maps, arithmetic, exercise books, essays in both English and Chinese, and kindergarten work, all done by pupils, constituted the bulk of the display and were a pleasant commentary on the introduction of modern educational methods. The ancient glories of Sian, once the capital of China, were recalled by a number of magnificent bronzes, lately unearthed near Fenghsiangfu, loaned by the provincial authorities for exhibition.

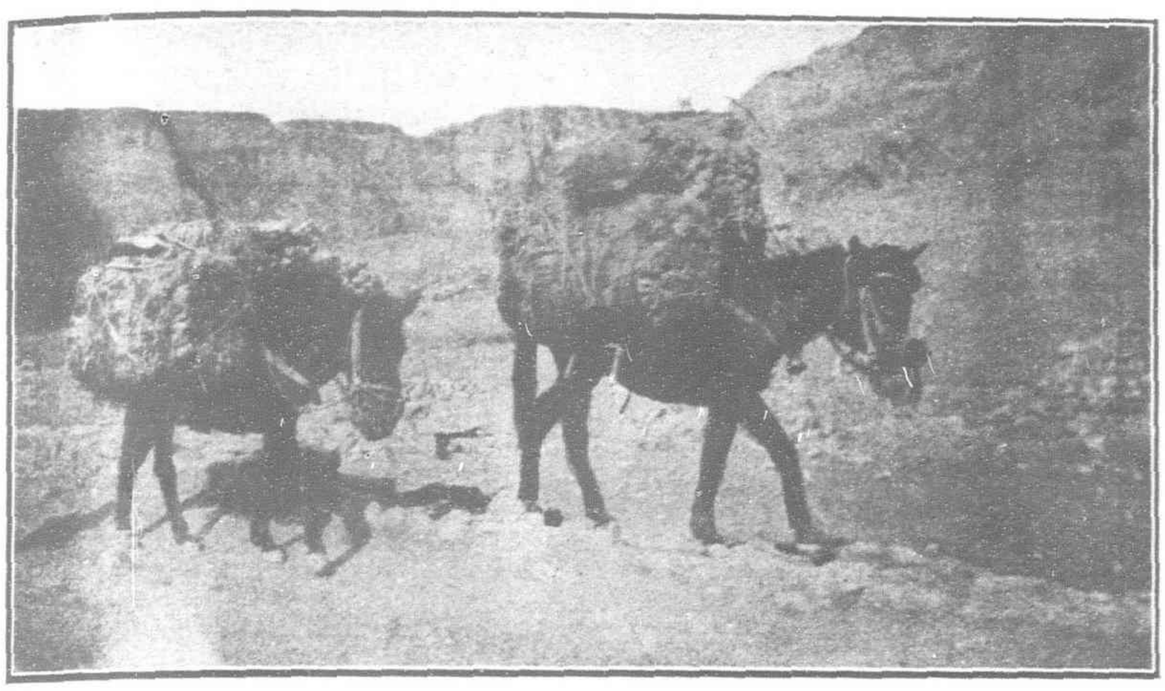
AMERICAN MACHINERY FOR MODERN FLOUR MILL.

A modern flour mill is in course of erection in Sian by the provincial authorities. A large 2-story brick building has been erected, but unfortunately at the time of inspection the machinery had not all arrived and very little of it had been installed. The orders were placed through an American firm in Shanghai and were for the most part for American machines. The power plant consists of a Babcock and Wilcox water-tube boiler (British), working at 150 pounds pressure, and a standard Corliss steam engine (Murray Iron Works, Burlington, Iowa). Electric light is supplied by a 25-ampere dynamo and switchboard built by the General Electric Co. of Schenectady, N. Y., driven by a small steam engine built by Marshall & Co. (Ltd)., Gainsborough, England.



Making Rice Bowl.

TRANSPORTATION IN SHENSI

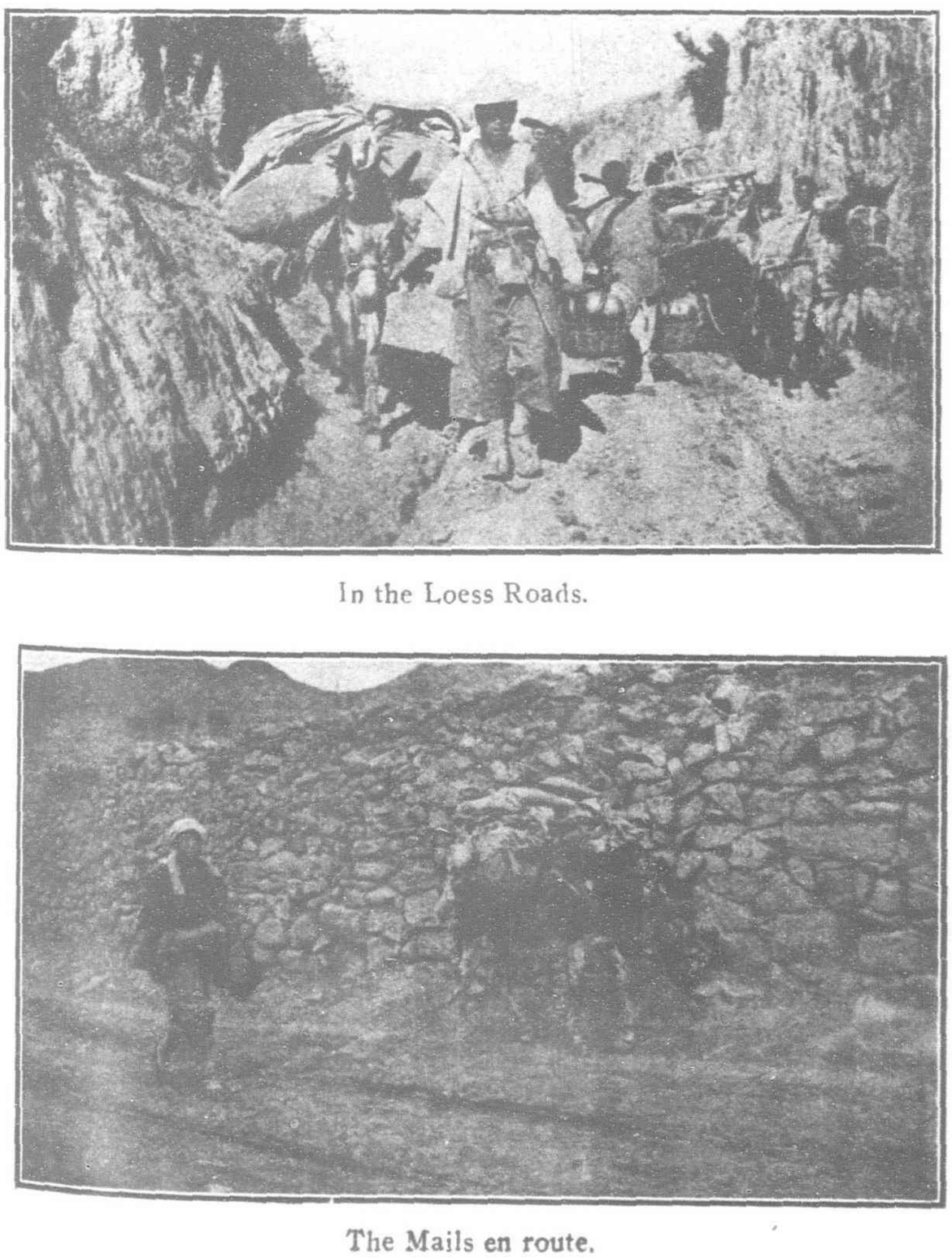


Going to Market.

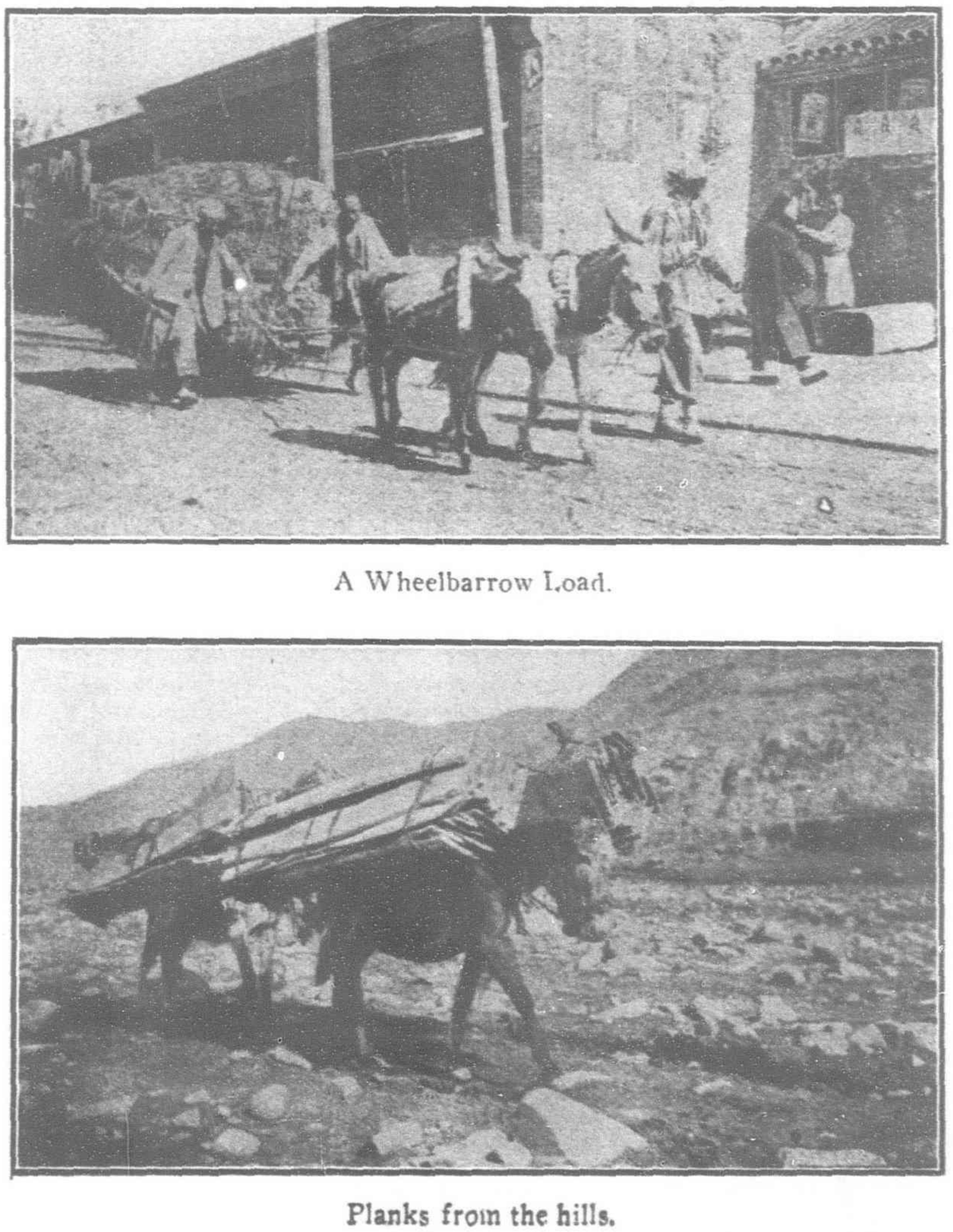
The Mule Litter. Putting in the hind mule.

Transporting Ingots of Iron.

A Peking Cart.



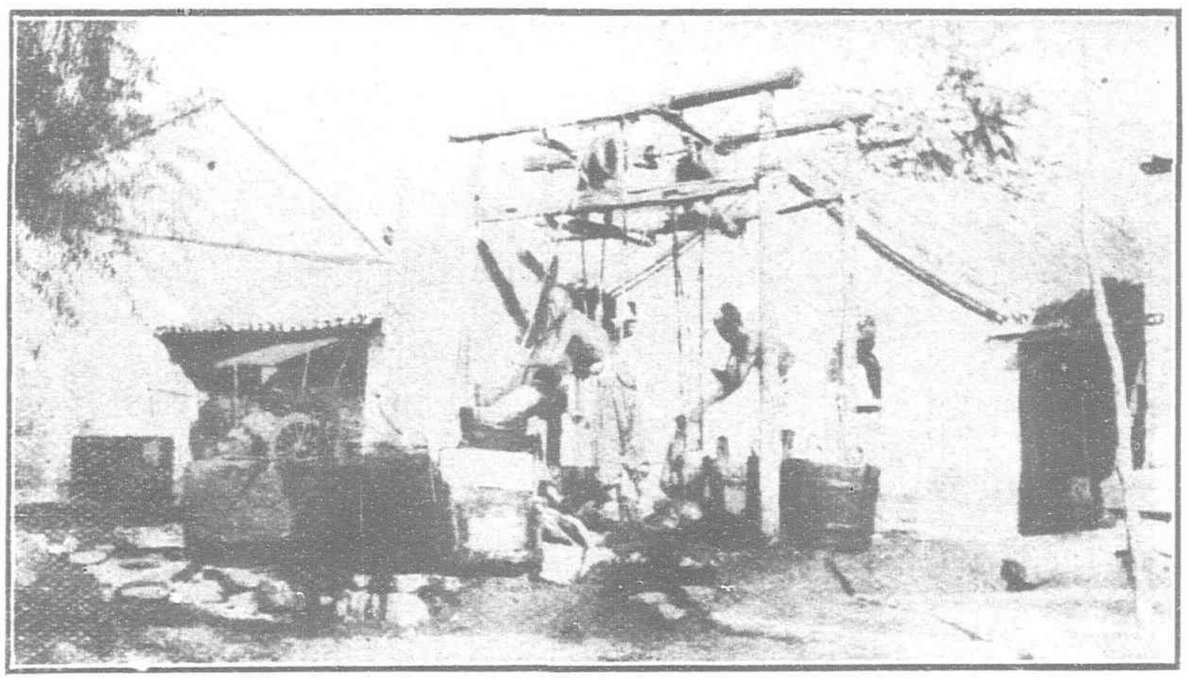
In the Loess Roads.



A Wheelbarrow Load.

The Mails en route.

Planks from the hills.



The Waterworks.

None of the milling machinery was yet in place, but the following were noticed awaiting installation: Middling's Finisher, Thos. McFeely Co., Philadelphia, Pa.; Monitor Adjustable Scouring, Polishing, and Separating Machine, Huntley Mfg. Co., Silver Creek, N. Y.; Barnard Moline Roller Mill, Barnard and Leas, Moline, Ill.; Granulate Bran Finisher, Thos. McFeely Co., Philadelphia, Pa.; Hoppes Exhaust Heater, Springfield, Ohio; and in the machine shop a machine tool drill, for hand use, and a machine tool lathe, for foot power, both built in Shanghai and equipped to be run by power if desired. This will be the first modern power plant in the Province, and the first time that electric lighting has been seen. It is reported that a telephone system is to be installed in connection with the mill, but it was impossible to obtain confirmation of this statement.

INDUSTRIAL TRAINING INSTITUTE.

Near the new flour mill is an extensive group of Chinese buildings given over to the Institute Training Institute. There are in the Institute about 200 students, all drawn from the poorer classes, learning seven different trades. Aside from the master workmen, who are the actual instructors, there is a staff of 15 directors and supervisors.

The majority of the students are engaged in learning some form of the cotton spinning or weaving industry. The spinning is done on small foot-power machines, built locally in wood after the pattern of imported iron machines, each machine having 20 spindles. There are seven of these machines in use, each capable of spinning about 3 pounds of cotton per day. Sixteen boys are in the spinning class.

In the cloth and towel weaving classes there are about 50 students. As with the spinning machinery, the hand looms are copies in wood of foreign iron machines. Six looms are in use for weaving cloth, 12 for making Turkish toweling, and 2 for making coarse huckaback toweling. The thread used is partly imported and partly of local origin. Turkish towels, very commonly colored either pink or blue, and both colored and figured cloth are woven. To this end a considerable part of the Institute is given over to dyeing thread. The cloth looms turn out per day about 30 feet each; the towel looms, 25 towels, 36 inches long.

SERICULTURE—CARPENTRY

A determined attempt is being made by the authorities to popularize the silk industry. Numerous varieties of the mulberry (the food of the silkworm) have been introduced from other parts of China and planted in official gardens. At the Institute the whole process of sericulture is taught, the silk piece goods produced being woven from silk grown and spun on the premises. At the time of the writer's visit it was too late in the year (November) to see anything of the methods of raising the worms or of spinning the silk thread from the cocoons. Weaving, however, was being done on hand looms of a native pattern. Each loom is attended by four workmen and has a daily capacity of about 20 feet of cloth 30 inches wide. Silk goods are dyed in the piece at the Institute, and both plain and figured cloth of various qualities and weights are woven. The silk booth at the Industrial Exhibition was most interesting, as the whole process of sericulture was shown by means of photographs, models of the machinery used, specimens of eggs, worms, and mulberry plants, and bolts of the finished product.

In the carpenter shop very passable copies of foreign imported furniture are turned out in a great variety of woods, of which walnut is the most popular. Better-class native furniture is also made. There are 15 students in this shop

NATIVE COTTON AND WOOLEN RUGS—LACQUER WORK.

In addition to the above, three purely native trades are taught—weaving cotton rugs in the native fashion, weaving woolen Tientsin rugs, and making lacquer ware. Native cotton rugs are woven in a curious fashion. No loom is used, the warp being raised from the floor by brackets some 30 feet apart, between which it is stretched at a distance of a few inches above the ground. The rugs are woven in sections 1 foot wide and 6 feet long, five of such sections being woven in one piece. The operator squats across the warp. with the finished portion of the strip behind him, and moves a small stand, which separates the strands of the warp, along in front of him as he works. The shuttle is thrown by hand from side to side. For the warp foreign imported cotton thread is used, while for the woof native thread is found to be sufficiently good. A pattern is woven in, the right and left hand and middle sections being woven at different times, but with such a degree of accuracy that the figure of the pattern matches perfectly when the rug is assembled, which is accomplished by sewing together the four appropriate sections, making a rug 6 by 4 feet, closely woven and about the weight of a piece of heavy canvas.

All sorts of articles, from small pin boxes to heavy furniture, are manufactured in lacquer. For small articles a base of leather is used; this is wet, placed on a last of the desired shape, and pounded and ironed until it takes the shape of the mold and its edges adhere one to the other. The receptacle so formed is roughly coated with lacquer inside and out, further coats being added until the necessary degree of stiffness is secured. It is then hand polished with wet charcoal until smooth, when the fine upper coats are applied. The number of these depends on the quality and ornamentation desired, articles carved in heavy relief requiring many more coats than those bearing a plain polished surface. For the larger articles, such as furniture, trunks, etc., a wooden base is used. At the Industrial Exhibition a great variety of lacquer ware was on view, including a pair of very handsome Chinese wardrobes with paneled doors. These measured about 6 feet in height by 5 in breadth by 1¼ feet in depth and were sold for about $22 U.S. for the pair.

WEAVING TIENTSIN CARPETS—INSTITUTE GRADUATES.

The third of the purely Chinese trades taught is the weaving of Tientsin rugs or carpets. The warp and woof of these are heavy cotton thread, generally of foreign origin, and the pile either camel's hair or wool. The warp is stretched vertically from a fixed support at the top over a roller at the bottom. The woof and the pile are put in by hand. Several workmen are engaged on the same rug at the same time, as each man can handle but 5 feet in width on the rug. The pile is applied by knotting woolen yarn loosely about the warp; the ends of the yarn are then cut roughly with a knife. The woof is next woven in above the last line of pile, and hammered down with a small woolen mallet. The pile is now trimmed to the desired length with shears, and the process repeated for each line of pile. When several feet of the rug have been completed the finished portion is taken up over the roller at the bottom, the warp being adjusted at the same time on the fixed support above.

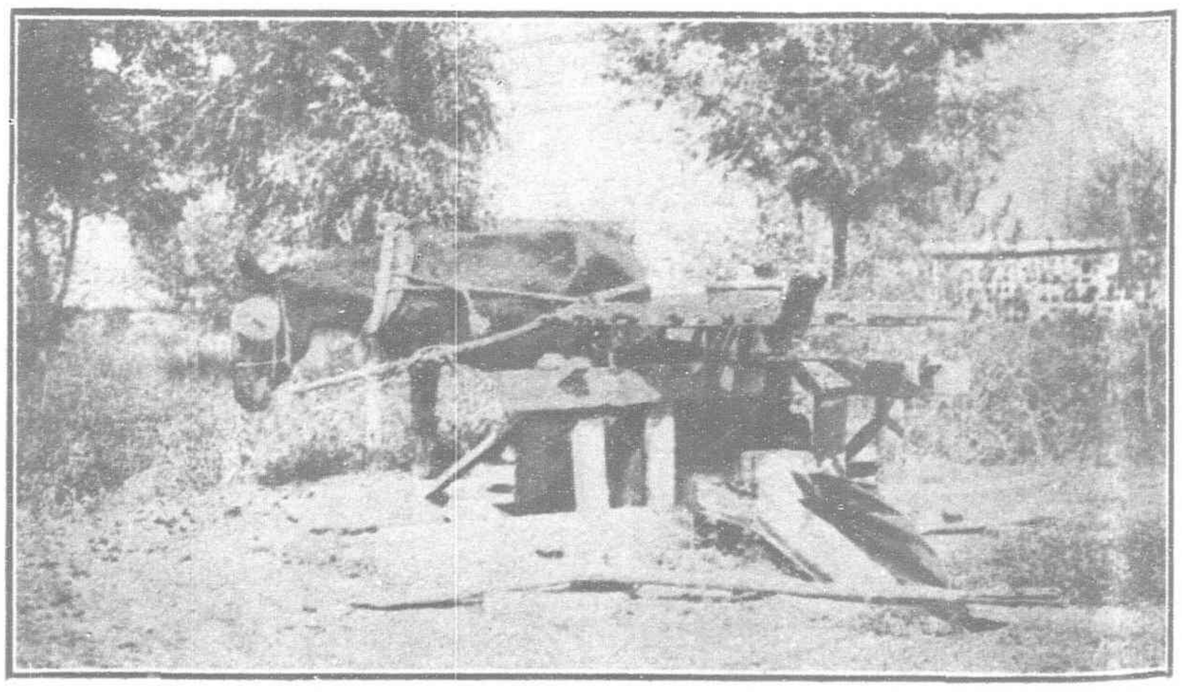
Rugs are woven at the rate of a foot a day, the number or workmen on each rug depending on its width, as explained above. Most intricate patterns are woven with no guide for the workmen beyond their memories. The price of a rug depends on its quality, which is judged by the material employed and the number of strands of woof to the inch. That on the loom at the time of inspection was roughly 15 feet square and was valued at $22.

The students in the Institute receive no pay, but are given board and lodging. No apprenticeship fee is asked, as the intention is to draw the students from the poorer classes. The students appear younger than would be expected, being boys of 10 to 15 years of age. Work begins at 7 in the morning and continues until 5 in the evening, or as long as daylight lasts. The course is of three years, at the end of which time those who have qualified are in a position to earn from 4 to 7 taels per month ($3 to $5), which is considered good wages in Shensi. Some of the graduates are retained at the Institute as instructors, others secure positions as instructors in similar institutes in other parts of the Province, while the majority are expected to find work with the general public.

OIL WELLS OF SHENSI.

The existence of oil in considerable quantities in the Province of Shensi has been known for many years. It is only recently, however, that there has been any attempt to make commercial use of these deposits. Some two or three years ago a Chinese company was formed to exploit this field. Four successful wells have been drilled, of which, however, two have had to be abandoned. Two remain in operation and yield a daily output of about 2,700 pounds of oil. A much larger quantity could be produced, but the available supply of labor is insufficient to meet the present demands, and expansion is therefore impracticable for the moment. The oil is refined at the wells and packed in 5-gallon cans, two to the case, in the fashion made familiar the world over by American exporters of kerosene. The wood used in the manufacture of cases is of local origin and inferior quality, while the tinned sheets for the cans are imported from abroad and set up at the factory.

(*Continued on page 143*)



Drawing Water.

TYPES OF LOCOMOTIVES

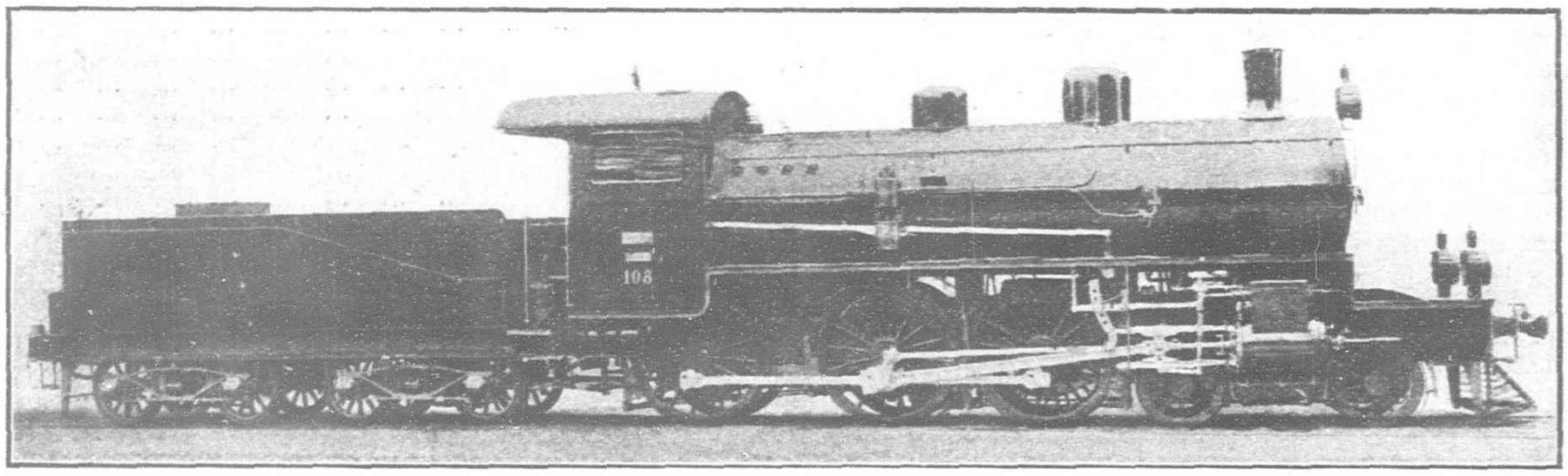
MESSRS. HENSCHEL AND SOHN

Illustrations herewith show some types of locomotives supplied to the Far East by the Locomotive Works of Messrs. Henschel and Sohn of Cassel, Germany. The first is a 4:6:0 passenger locomotive supplied to the Tientsin-Pukow Railway.

This engine has the following chief characteristics:

Gauge	1435 mm
Diameter of steam cylinders	540 mm
Stroke of pistons	630 mm
Diameter of drivers	1750 mm
Diameter of truck wheels	1000 mm
Rigid wheel base	4300 mm
Total wheel base	8100 mm
Working pressure	13 kil. p. sq. cm
Heating surface of fire box...	13,77 sq. m.
Heating surface of boiler tubes...	160,93 sq. m.
Heating surface, total	174,70 sq. m.
Grate area...	2,61 sq. m.
Weight empty	61000 kilos
Weight in working order	68500 kilos
Adhesive weight	48000 kilos

The locomotive has three pairs of coupled wheels, the middle pair of which are the driving wheels, and a 4-wheeled bogie in front. The boiler barrel, having a mean diameter of 1700 mm, is equipped with 294 steel boiler tubes of 46-41 mm diameter. The water space between the single tubes at the fire box tube plate is 34 mm, and the length of tubes between the 2 tube plates, is 4250 mm. The fire box shell is placed between the frame plates and encloses the deep down reaching copper fire box. On account of the very clinkery quality of coal to be burnt by the engines, a rocking grate is provided. The mountings of the boiler consist of 2 pop safety valves, system Coale; 2 steam injectors system Schäffer and Budenberg, each of an output of 180 litres per minute; 1 water gauge with 3 test cocks; 1 boiler filling cock; 2 boiler feed valves; 1 steam whistle; 1 steam gauge, with test gauge cock. The throttle valve of the Schmidt and Wagner type is placed inside the dome and can be operated from the engine cab.



Passenger Locomotive supplied to the Tientsin-Pukow Railway.

The frame is formed by two strong and substantially built up plates of 30 mm thickness which are well stayed to each other by means of longitudinal and cross stays as well as by the bufter plates and the coupling box.

The steam is distributed by means of Hoff balanced flat slide valves, which are operated by the Heusinger valve motion.

The double roofed engine cab has glass windows which can be replaced in the summer by wood shutters.

The compressed air Westinghouse brake acts on one side of the driving and coupled wheels as well as of the wheels of the tender. Besides this a hand lever brake for the tender is provided. The engine is further equipped with a compressed air sander for sanding the driving wheels, a de Limon steam driven lubricator for pistons and slide valves, a steam heating arrangement, and a cow catcher in front of the buffer beam.

The tender holds 20 cubic metres of water and has a coal capacity of 6,000 kilos. It rests on 2 four wheeled bogies and has a weight empty of 22,500 kg; its weight in working order is 48,500 kg.

The draw and buffing-gear consists of an automatic claw coupling, system Henricot, with a release device, which is operated from the side.

The next is a 0:6+6:0 Mallet superheated steam locomotive with tender, supplied to the Japanese Government Railways.

This locomotive is designed for hauling goods trains of about 400 tons gross weight on gradients of 20 0/00 at a speed of 25 kilometers per hour, and goods trains of 1400 tons gross weight at a speed of about 45 kilometers per hour on the level. The engine must be able easily to take curves having a radius of 90 meters. The required high tractive force combined with the narrow gauge of 3.6 (1,067 mm) necessitates 6 pairs of driving wheels which arrangement with regard to the curves can satisfactorily be found in the Mallet type only.

The engine has therefore two groups of frames, each with 3 pairs of coupled wheels. Both groups are flexibly articulated whereby each of them can easily accommodate itself to the radius of the curve.

The boiler is rigidly fixed to the rear frame; above the cylinders it is kept in position by means of a cast steel saddle piece riveted to the latter. Whilst thus side movements of the boiler are prevented, it may expand forward and backward. The boiler is amply dimensioned and, in order to increase its capacity, is fitted with Schmidt's superheater, which is placed inside of 16 flue tubes of an outside diametre of 140 mm. From the throttle valve in the dome, the steam enters, at the front-tube plate, the superheater header, then passes the superheater tubes placed in the 16 large flue tubes and returns to the superheater header. Through this process the temperature of the steam is raised to 330-350 centigrades. From the superheater header the steam flows now through two pipes fitted at the end with glands and conducted along the outside of the boiler, to the H. P. cylinders, from where the last axle of the rear group is driven. After having worked in the H. P. cylinders, the steam is conducted through a receiver which on its both ends is flexible in glands and which are movable in the longitudinal direction to the L. P. cylinders driving the front group of wheels. From there it passes through a flexible exhaust pipe and escapes through the chimney. In order to facilitate the engine especially when starting and hauling heavy trains, live steam can be admitted to the receiver through a valve connected to the valve gear, when the latter gives large admissions of steam to the cylinders. All cylinders have piston valves with inside admission, which valves are moved by Heusinger gear. The valve gears are guided by each other, the low pressure gear is, however, arranged in a manner that it will always give a somewhat higher admission than the high pressure gear. The piston valves and steam pistons are lubricated by means of grease pumps, the high pressure cylinders by one with 6 feeds and the L. P. cylinders by one with 4 feeds, both being driven by the H. P. valve links.

The frame, of the American bar frame type, is substantially braced by cross stays. The springs of the rear frame axles are placed in suitable openings of the frame and are carried by axle boxes resting on balancing beams. The springs of the front truck are placed in the usual manner above the axle boxes and frame, and are also connected by balancing beams. As the front trucks of such engines tend to hunt, when running in the straight, a strong centering spring is placed beneath the smoke box, which considerably reduces the movements of the front truck. This spring serves besides to centralize the front bogie, when the engine is leaving curves.

The tender is carried by 3 pairs of wheels and holds about 12.5 tons of water and 3-4 tons of coal. The front axle of the tender is rigidly fixed to the frame, whilst the second and third axles are united to a bogie of the Diamond type. The tender is therefore able to pass through every curve with facility.

Both engine and tender are braked by an automatic vacuum brake; three brake cylinders act on the locomotive wheels and one on the tender wheels. Besides this a powerful hand brake for both engine and tender is provided.

Apart from the usual mountings, etc., of the boiler among which there is also a rocking grate, the locomotive as a special device for cooling, on runs over long distances, the brake blocks by water from the tender. There are further 2 sand boxes, one for each steam truck. The cab is very spacy.

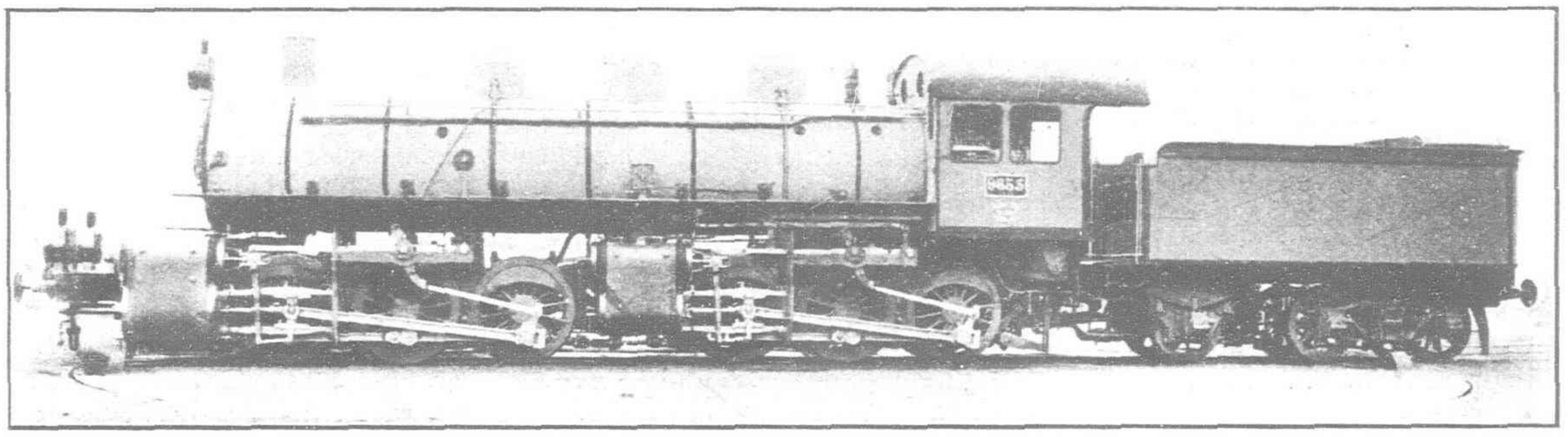
The third is a 0:6:2 tank locomotive for the Japanese Government Railways.

This type of engine, a large number of which was supplied to the Japanese Government Railways, has the wheels as well as the slide valve chests and the valve motion inside the frame, whilst the cylinders are placed outside. The engine has three pairs of coupled wheels, the middle of which are the driving wheels, and a two-wheeled rear radial truck. Its chief outlines and charateristics are the following:

Gauge...	1067 mm
Diameter of Steam Cylinders	406 mm

Stroke of pistons	610 mm
Diameter of Drivers	1245 mm
Diameter of truck wheels	965 mm
Rigid wheel base	3820 mm
Total wheel base	6020 mm
Boiler pressure	11,2 kil. p. sqcm.
Grate area	1,34 sq. m.
Heating surface	94 sq. m.
Water Provision	6,8 cb. m.
Coal Provision	2,1 cb. m.
Weight, empty	about 38000 kil.
Weight in working order	about 50500 kil.
Adhesive weight	about 40000 kil.
Tractive power	5420 kil

Boiler: The boiler has vaulted fire box shell crown running out in the boiler barrel and is fitted with a deep copper fire box, which has a straight crown sloping towards the back. Crown and side plates consist of one single piece. The corners are made of large radius. The crown of the fire box is supported to that of the fire box shell by means of mild steel stay bolts, the front four rows of which are made flexible. Above the fire box crown the fire box shell is braced by means of cross stays. The straight side plates as well as the front and rear plate of the fire box are stayed by copper stay bolts with holes drilled in at each end. The top and front rows of stay bolts of the side plates are made of Stone's bronze and have four slits with a view to making them particularly flexible. The back plate of the firebox-shell is connected to the smoke box tube plate by means of longitudinal stays.—The longitudinal seams are butt-jointed and double riveted, the cross seams overlapped and single riveted. The boiler barrel has a average diameter of 1,230 mm and is fitted with 192 brass boiler tubes of an outside diameter $1\frac{3}{4}$," the ends of which are protected against burning through by steel ferrules. From the top part of the steam dome which is placed on the boiler barrel, the steam is allowed to flow to the cylinders by means of a throttle valve.

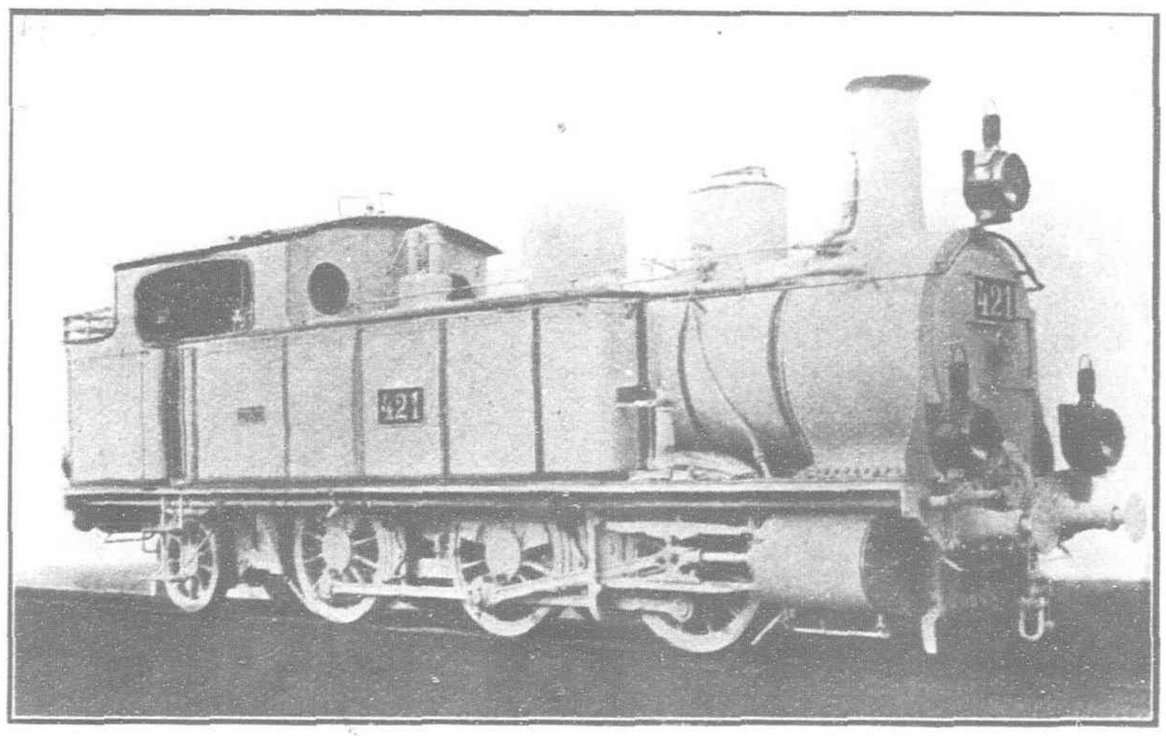


Mallet super-heated locomotive supplied to the Japanese Government Railways.

Mountings: The boiler is fitted with a spring loaded double safety valve, 2 water gauges with ball lock, 2 combined Gresham and Craven injectors, 1 Bourdon steam gauge, 1 test steam gauge, 1 blow off cock, 1 blower cock and two steam whistles mounted on a common bracket.

Frame: It consists of two side plates, which are substantially braced by means of strong sheet and angle irons as well as by cast steel stays. On the front and rear are strong cross plates, to which the buffers and draw hooks are fitted in accordance with the specification of the Japanese State Railways.

Motion Gear: Axles, tyres, connecting, coupling, and piston rods are of Siemens Martin steel, whilst the wheel centres are of cast steel. The axles box bearings are of gun metal and have white metal linings. The cast steel axle box bearings can be adjusted by means of adjusting wedges. The radial axle is kept in its central position by a spiral spring, which has an increasing return power. The engine is carried by laminated springs, which are placed below the compound axles and above the truck axle. The springs of the two front axles are united by compensation beams.



Tank locomotive supplied to the Japanese Government Railways.

Valve Motion. The steam distribution is done by simple plain gun metal slide valves operated by the Stephenson valve motion. The engine is reversed by means of a lever.

Cab. The locomotive has a spacy cab, which is provided with a roof to protect the staff. The two windows in the front and the back of the cab as well as those provided on either side enable the driver closely to watch the track. On account of the special climatic conditions, which were to be taken into consideration, the engine was fitted with a double roof of teak wood.

Water Tanks and Coal Bunkers. The water tanks are placed on either side of the boiler and are projecting into the cab. Another tank is arranged behind the cab and carries in its upper part the fuel provisions. As the majority of coal and water provisions are resting on the rear truck axle, the adhesive weight is not sensibly influenced by the variations of weight of the fuel and water provisions.

Brake. The engine is fitted with a screw brake and a vacuum brake, made by the Vacuum Brake Company, both operating the same rigging and acting on the brake blocks of the coupled wheels.

Sander. When running forward the engine is sanded by the cast iron sand box placed on the top of the boiler, whilst at the backward run sand is taken from two boxes placed underneath the running board. All sand boxes are operated from the cab by sand.

Lagging. Boiler and cylinders are provided with tightfitting sheet coverings.

Pistons and slide valves are oiled by a Wakefield lubricator. The engine is provided with all necessary tools and appliances. All materials were made in accordance with the specification of the Japanese Government Railways.

Finally there is a 0:8:0 Tank Locomotive with front and rear adjustable axle of the Klien Lindner type; supplied to Java.

This type of locomotive, has been supplied in great quantities to sugar plantations on Java. In order to meet the requirements of the purports, it is destined for, the locomotive is fitted with four pairs of coupled wheels, the front and rear of which are adjustable and of the Klien Lindner type. The wheels are placed inside the frame, whilst the cylinders and the motion gear are arranged on the outside. The main features and outlines of this locomotive are the following:

Gauge	750 mm
Diameter of cylinders	240 mm
Piston stroke	300 mm
Diameter of wheels	630 mm
Rigid wheel base	800 mm
Total wheel base	2300 mm
Boiler pressure	12 kil. p. sq. cm.
Grate area	0,49 sq. m.
Heating surface	24,1 sq. m.
Water provision	2, - cub. m.
Fuel provision	1,5 cub. m.
Weight, empty	about 11000 kil.
Weight in working order	about 14800 kil.
Tractive power	1980 kil.

Boiler. It is of the ordinary locomotive type and has a copper fire box with a flat crown, which is running out into the side plates in a large radius. The fire box crown is united with the crown of the fire box shell by means of iron crown stays. The straight side plates as well as the front and back plates are braced by cross stays. The back part of the fire box shell and the smoke box tube plate are strengthened in their top part by means of plate stays. The longitudinal seams of the boiler are double, the circular ones single riveted and in either case overlapped. The boiler barrel is fitted with seamless drawn mild steel boiler tubes and carries on its top part a dome, from which by means of the regulator the steam is admitted to the cylinders. The boiler is fitted with all accessories and fittings prescribed by the Dutch Indian Law for land boilers.

Frame. The frame is placed outside the wheels and consists of two lateral plates thoroughly braced by cross stays. On the front and rear ends of the frame strong buffer beams are fitted, which carry the draw and buffing gear. The front and rear coupled hollow axles allow of axial and radial play and ensure a smooth rounding of curves.

Driving Gear. Axles, tyres, driving, coupling, and piston rods are of Siemens Martin steel, whilst the wheel centres are of cast steel. The slide bars are of mild steel, forged, and have case hardened wearing surfaces. All bearings are of best bearing metal and have white metal liners. All eyes, forks, and bolts of the valve gear parts are case hardened.

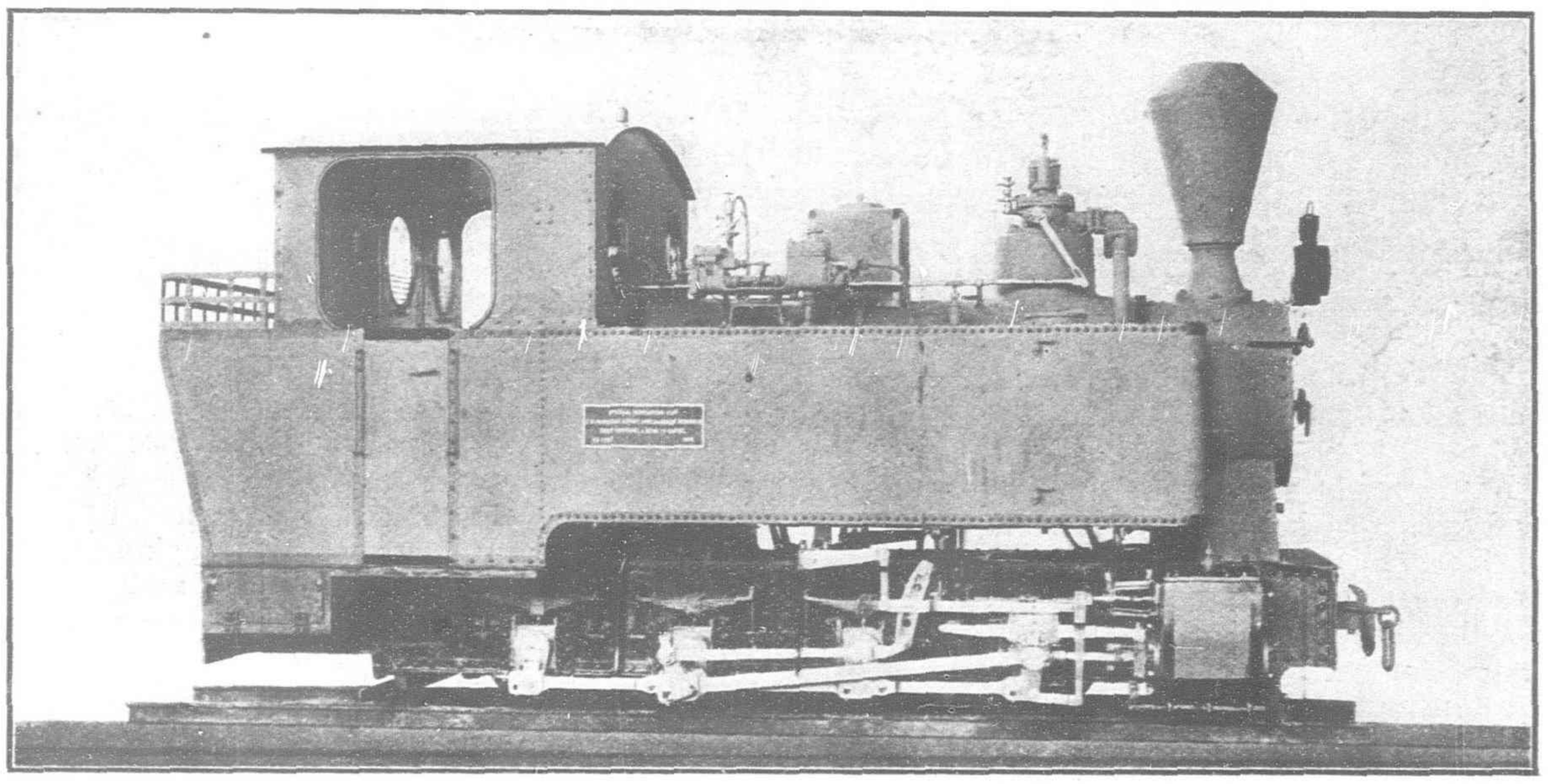
Valve Gear. The steam is distributed by a simple flat slide valve, which is operated by the Heusinger valve motion. The engine is reversed by means of a lever.

Cab. The spacy cab is covered by a root.

Tanks and Bunkers. The water tanks are placed in front of the cab on either side of the boiler, whilst for the fuel a bunker is provided behind the cab across the frame.

Brake. The engine will be fitted with a counter-weight and a steam brake, which operate the same rigging and act on the middle axles. There is further a counter steam brake, which will be put in action when the engine is passing long and steep slopes.

The chimney is of American design and constructed as a spark arresting chimney. Boiler and cylinders are protected against loss of heat through radiation by means of sheet covering. A central lubricator oils cylinders and slide valves. The sand box is placed on the top of the boiler and operated by hand; it renders it possible to sand the wheels in either direction. The engine is equipped with all necessary tools and appliances. The materials used for the construction are made in accordance with specifications of the Prussian State Railways.



Tank locomotive supplied to Java.

(*Continued from page 140*)

The machinery in use is partly of American manufacture and partly of Japanese. Power is supplied by a gas-producer plant using oil for fuel. There appear to be no competent engineers employed, and only a few Japanese mechanics. A case of 10 gallons of the company's oil sells in Sianfu for about $3.50 U. S.

Apart from the shortage of labor mentioned the greatest handicaps under which this enterprise suffers at present are lack of transportation facilities from the wells to distributing centers, and insufficiency of cipital. The wells are situated in Yenchang district and are about 150 miles from Sianfu in a northerly direction. They are close to a small tributary of the Yellow River, some 20 miles above its junction with that stream. This waterway forms the only practical route for shipping the oil out; at best, it is unsatisfactory and comparatively expensive. Yenchang district being over 100 miles north of the proposed line of the Hai Lan [Haichow-Lanchow] Railway, no relief can be expected from the construction of that line. Possibly the projected railway from Taiyuanfu in Shansi to some point in Szechwan may pass somewhere near to the wells. The company requires more capital, which, however, it is unable to secure at present, owing to the general dislocation of trade consequent upon the revolutionary disturbances and to the stringency of the Shensi money market.

CHINESE POSTAL SERVICE.

Of the innovations and modern methods introduced by the foreigner into China, few are more appreciated than the postal service. Originally a branch of the maritime customs, maintaining a limited service between the principal ports, the Chinese postal service has been developed during the last 20 years until it is now possible to mail letters into practically every district city in China, while domestic postage rates on letter mail are lower than in the United States. An efficient and popular money order system is in operation between the principal offices, which, in many interior districts, affords the only safe way of remitting funds from place to place. Despite the fact that there is no steam transportation of any sort in Shensi, the postal service has opened more than 180 offices in the Province, which are maintained by about 6,000 miles of courier lines and is constantly opening up new offices. A parcels service is in operation, for which pack mules are used, while the fast letter service is maintained by a day-and-night foot courier, covering 60 to 70 miles per day.

SHANGHAI MUNICIPAL ELECTRICITY DEPARTMENT

The tender of Messrs. Andersen, Meyer & Co., has been accepted for the supply of eight 80 H. P. 3-phase motors for the Shanghai Municipal Electricity Department.

Following are the tenders received:—

Jardine, Matheson & Co., Ld	£1,441.10
Siemens China Co.	1,130.0
Anderson, Meyer & Co	1,009.5

GERMAN TRADE IN CHINA

Before the outbreak of war an article was published in a Leipzig paper calling attention to the insufficient interest taken in Germany in the possibilities of trade development in China. The article, which is said to be written by a member of the Stötzner Szechuan Expedition, remarks that the German merchant is not as active as his competitors in China. The annual value of the imports from Germany only amounted in 1913 to about £4,270,000 or about 5 per cent. of the total imports, whereas the imports from the British Empire amounted to 56 per cent., from Japan to 20 per cent., and from the United States to 6 per cent. of the total. Some idea of the possibilities of developing trade with China may be gained from the fact that the imports into that country only average 2s. 6d. per head per annum as compared with £1 per head in Japan. The German merchant in China is exhorted to devote more attention to the sale of German goods, and not to act, as at present, mainly as a dealer in British goods. Presistent advertising, both by posters and the distribution of samples, is recommended.

The article advocates the sale of articles of popular use, and suggests that goods should be sold in packets containing a selection of small articles used together; for example, a packet might be made up in accordance with Chinese taste containing a selection of needles, cotton, coloured wool and a few buttons. Such a packet should sell for about a penny and should be conspicuously marked with the maker's name. Similarly patent medicines, with directions in Chinese, might find a market. In all cases, however, the small purchasing power of the individual Chinaman must be borne in mind.

PHILIPPINE CEMENT MAKING

Work on the new $600,000 cement factory at Binangonan, Province of Laguna, is progressing rapidly and it will probably be in operation by December 15, 1914. It will be one of the largest manufacturing enterprises in the Philippines and will have an annual capacity of 150,000 barrels of cement. It will furnish employment for about 1,000 men, half of whom will be laborers, the remainder more or less skilled. A 5-mile aerial cableway will convey the limestone from the quarry at the rate of 27 miles an hour and deliver it in the storage room of the plant without rehandling. A large pier is being built out into Laguna de Bay, from which the cement will be loaded into lighters for shipment to Manila. A barrel factory will be operated on the premises to utilize native timber. The plant will be operated by electricity enerated from steam power.

THE MENACE TO HEALTH IN HONGKONG AND SHANGHAI

THE NIGHT SOIL PROBLEM

When the European came to the East, settled down and built his homes and offices, the problem of house drainage and the disposal of night soil was readily solved. He simply fell into the ways of the natives and adopted the antiquated system of hand removal. The solution was easy and the vexatious engineering problems involved in designing a proper sanitary drainage system were so complicated, and the probable cost so excessive that the municipal authorities of the various ports in time came to look upon the Chinese way as the best for all concerned.

The disposal of the night soil through native contractors who resold the refuse to the nearby farmers, gradually developed into a most lucrative business from which the municipal treasuries reaped a handsome income. And as year followed year and the little foreign ports and settlements expanded into the present great commercial entrepots of the Orient, the ordure business also grew and prospered, the profits and municipal incomes keeping pace with the rapid increase in population. As the difficulties of establishing modern sanitary systems increased with the development of the ports, and the municipal treasuries each year reaped a still higher revenue from the disposal of the night soil, and as each year saw the erection of larger and more expensive buildings without the slightest pretext of conforming to modern sanitary ideas, the large landlords and their representatives on the Municipal Councils, began to defend the abominable traffic as the most economical, and most conducive to the health of the community. And so the system has been officially approved and the ratepayers educated into the belief that there is no other way out. The Chinese contractors cart the refuse away to the fields, and the farmers return it to the ratepayers in vegetable truck loaded with death-dealing cholera, typhoid and dysentery germs. And the yearly toll is mutely paid by the long-suffering ratepayer in shattered health or by the greatest price of all and still, no protest is raised, nor demands formulated for a remedy. Ask any man in Hongkong or Shanghai why the town is not provided with modern sanitary arrangements, and he will find many good reasons and excuses for the existing system. It has been drilled into him by the reading of official reports, and with blind faith he accepts the reasons given as a matter of course.

But we are glad to see that Hongkong is waking up. Singapore and Manila, for years the centers of plague and other epidemics, have expended huge sums in modern drainage systems and as a consequence life is now safer and more enjoyable in those ports. On the other hand, newcomers and visitors passing through Hongkong and Shanghai, are loud in their condemnation of the utter absence of modern sanitary improvements in the hotels and houses of these ports. There are exceptions however to this, as there are a few hotels on the China Coast who have advanced as far as the law will permit them to.

It is an old problem and has been threshed out time and again, but as the years pass rapidly on, it must be squarely faced and some solution other than the existing one, found. We are glad to see that there are a few public spirited men in Hongkong who realize the gravity of the problem in that Colony, and who have requested the Government to appoint a commission which will make a comprehensive inquiry and report on a proper water carriage system, without which no drainage problem could be solved. The *Hongkong Telegraph* commenting on the situation says: "There are some members of the Sanitary Board who realise that point, as the discussion at yesterday's meeting showed. Chief of these is Dr. Fitzwilliams, a man to whose opinions due weight should be given. In his view, Hongkong is not an up-to-date sanitary city—it is one which is labouring under an antiquated system which has many deficiencies. That submission is one which will, we are sure, be endorsed by nine-tenths of the inhabitants of the Colony, who have suffered too long the inconveniences of existing methods for the disposal of sewage. The main objections which have been levelled against the adoption of the water-drainage system in Hongkong are that the place is not easy to drain, and that sea-water (of which we surely have an abundance!) is not suitable for flushing purposes. But Dr. Fitzwilliams disposed of these contentions very quickly. He showed how in a flat place like Cairo, which has none of the advantages of Hongkong so far as drainage is concerned, such a system operates with excellent results, and he might have come nearer home and pointed also to the case of Shanghai. Then he cited Gibraltar, which has much the same physical formation as Hongkong, and indicated how well the system worked there. Far from being a difficult place to drain, Hongkong is an extremely easy one. Then, too, the doctor pointed out that sea-water is utilised for flushing in many places with excellent results. The fact is, of course, that it is all a question of money, but that should not stand in the way of a solution of the problem. The Colony's health should be the first consideration of the Government, whatever the cost."

There are perhaps good reasons why the existing water mains of Hongkong should not be utilized for flushing purposes, the main objection being the insufficient supply of fresh water, but there appears to be no good reason why salt water could not be employed instead. It will cost money, but all large schemes of this nature are expensive, and can be paid for by a bond issue covering a long term of years so the expense will be borne by future beneficiaries of the work.

We have full confidence that once the traditional red tape of the Crown Colony is cut through, and permission secured from the Government to proceed, our Hongkong neighbours will rise to the occasion and find the ways and means to carry into effect some modern sanitary scheme proposed by a competent committee of investigation.

And now that the seat of British influence in the East has at last shown signs of combating the old tradition that hand removal is the most efficient, perhaps some of the Municipal authorities in the lesser ports under British influence will follow suit. Perhaps even our Shanghai Municipal Council may be awakened to a sense of its obligations to the community it serves to give this grave matter passing notice, though we can readily foresee that in this Model Settlement, many arguments will be advanced, obstacles will be raised and objections insisted on to permit matters to stand as they are, and the old beliefs so thoroughly drilled into a passive community will again prevail.

There are doubtless many good reasons why such a scheme has not been adopted in Shanghai. Chief amongst these is the location of the port and its limitations. The waters of the Whangpoo River below the Settlement are drawn on for the general water supply, which precludes the use of the immediate river as an outlet for a drainage system. Any such scheme would have to provide for an outlet somewhere near Woosung; at once costly and difficult, owing to having to obtain permission from reluctant Chinese authorities. Then again the land is so flat and only a few feet above tide level. But, notwithstanding all the political, engineering and financial difficulties and drawbacks, some scheme could be devised if the proper spirit were manifested in its adoption. The cost must necessarily be great but the community would gladly pay it.

Shanghai is growing rapidly. On all sides handsome modern office buildings and homes are being erected, land is increasing rapidly in value, and the old Chinese rookeries down town are gradually giving way to more substantial edifices. In another ten years the commercial district will extend beyond Honan Road, and it is not difficult to conceive in the mind's eye the gradual spread of the office district westwards, and the future closely built up residential sections of Bubbling Well and the French Concession. And as the port expands, so will the objectionable and malodorous commerce in ordure expand with it. The problem of removal and disposal will every year increase, and the work of removal instead of being confined to the early morning hours will be extended into the day. The removal of sullage and faeces only once in twenty-four hours, and the passage of the night soil carts and buckets through the streets of the city, with the liberation of feculent and dangerous gases, and the contamination of the streets by sloppings and leakages, constitute a grave peril to the health of the community. No argument can refute this statement. Yet this medieval, insanitary and disease-spreading practice is strongly intrenched in Shanghai and defended by the authorities.

We turn for enlightenment on this standing menace to the health and good name of Shanghai, to the Annual Municipal Reports, and we find for the year 1908, that over 77,000 tons of night soil were removed from the Settlements, and the Report naively adds as though in justification of the system, that complaints from the public regarding ordure removal "*continue* to be few in number." Naturally there are few complaints. The long-suffering Shanghai ratepayer has found that to complain is useless, and is compelled to accept the situation. The average ratepayer's opinion is of little weight in the community, because any scheme calling for large expenditures, to be successfully carried through must emanate from the oligarchy of landlords, absentee and present, or their mouthpieces, who are the real rulers of the Model Settlement. And who ever heard of a landlord initiating any movement for the protection of the public health, which will compel him to place in modern sanitary condition the properties rented to the ratepayers? This is, however, another story.

In the Municipal Report for 1911, we read: "The removal of ordure continues to be efficiently done and is a source of considerable profit to the community. The amount paid monthly by the Contractor in the sequence of agreements was in 1899, $3,200, 1902, $4,100, 1905, $5,300, 1908, $6,000, and for 1910, $7,500. There is a ready demand throughout the year for its use in growing such crops as indigo, and were it not *for its employment also in growing market produce for the table, which is practically impossible to prevent*, the method of disposal is more sanitary than any other, and as regards the economy of nature, nearly perfect." So here we have a glowing apology for the continuance of the business and the official assertion that the system is the most sanitary. Whoever wrote the above short item in the 1911 Report certainly deserves the warmest congratulations of the traffickers in the commodity, for it has been accepted as the standard phraseology in succeeding Reports, and has made the policy of the Municipal Board. In the Reports for 1912 and 1913 the identical words are employed, so the gullible ratepayer is lulled into a feeling of false security and convinced that after all there is no escape from medieval insanitation for the Model Settlement of Shanghai.

The authorities admit that the refuse is employed in the fertilizing of market produce for the ratepayer's table, and that it is practically impossible to prevent this. This last is in part true, for the refuse from the Chinese city over which no control can be exercised is also available for the nearby farmer's use. But it would seem to the foreign ratepayer in the Model Settlement, that some effort could be made to minimize the danger to the community as far as it lies within the power of the Municipal authorities. We read, however, in the 1912 Report the following:—"As a result of an offer from a Japanese source of $8,625 monthly for the privilege of removing the Settlement's excrement for the purpose of conversion into chemical manure (ammonium sulphate), tenders were called for some three months before the expiry of the present contract. Keen competition set in, so that 23 tenders were received ranging from $7,570 to $10,050, the highest tender being accepted," and then follows the traditional official apology and the stock statement about its employment in growing market produce for the table, which it is practically impossible to prevent, &c.

The official report itself is evidence of the desire of a Japanese concern to manufacture ammonium sulphate from the refuse, which would render harmless to the public health about 100,000 tons of excrement which is now permitted to fertilize the vegetable gardens of the neighbouring farmers. The danger to the public health would have been decreased by one half at least, always bearing in mind other sources of supply which would be employed by the Chinese. The Japanese concern, whoever they are, ought to have been received as public benefactors, and their tender immediately accepted. But we find that for the sake of a paltry gain of $1,325 (Mexican) per month (£132) to the Municipal treasury, the old established traffickers in the commodity were able to retain their privileges, and the Japanese offer was rejected. The acceptance of the Japanese tender would have materially benefited the community and lessened the ever-present menace to health, yet this protection to the ratepayer was denied. In any other enlightened community questions would have been asked ere now, as to the reasons underlying the rejection of the Japanese offer. The answer, however, is plain. The only consideration which influenced the Municipal authorities having the matter in charge, were sordid financial ones. All they could see was a loss of £132 per month to the public treasury. No consideration of the public health was involved. The thought that perhaps the conversion of 100,000 tons of excrement into harmless commercial manure, would have any effect on the public death rate was apparently ignored. This callous disregard for the health of the ratepayer, for the sake of a paltry £132 per month could never have occurred in any other community. Leaving aside the ethics of the relation between the ratepayers and their servants, and viewed solely as a cold blooded municipal business proposition, it never seemed to occur to anyone that perhaps the $1,325 per month lost to the treasury in the malodorous traffic, might have been saved in the expenses of the sanitary department. But no, the Shanghai authorities have complacently adopted the old Chinese custom unreservedly, and are apparently concerned only as to the increase the traffic will add to the revenues. They deliberately threw away an excellent opportunity to protect the health of the community and provide an object lesson for other treaty ports and Chinese cities. The authorities are fully aware of the ultimate destination of the Settlement's night soil, and that it is returned to the Ratepayer on his market produce. As it cannot be prevented by the Municipal Officials, therefore the Ratepayer must look to himself. All that the authorities can do to protect the public health is to warn the Ratepayers through the Reports of the Sanitary Officer of the exact state of affairs, and devise rules of health for the householder to follow. Sterilize all food is the only safeguard, but this warning is constantly disregarded and the Ratepayer pays the price.

"When one recalls to memory the ghostly procession that yearly departs this life in Shanghai or goes home physically wrecked from these causes, it is extraordinary that more attention is not given to this important matter by the public generally." So says the Health Officer is his last Annual Report. He also says that "vegetables and fruit grown near the ground, being watered as a rule with night soil, are especially liable to be soiled with the germs of Typhoid Fever, Cholera, Dysentery and other bowel diseases," and that preventive measures are almost entirely in the hands of the householder, who is warned to thoroughly sterilize all food.

But when the care of our kitchens and the preparation of our food is largely in the hands of native servants, and where it is impossible in many cases for the foreigner to exercise personal supervision over these affairs, the inevitable result follows and sooner or later another beloved member of the community joins that ghostly procession which passes into the unknown from Shanghai.

There is no possible justification for further expansion of this traffic in Shanghai. The first step to be done is to follow the lead of Hongkong, and employ the services of the best drainage expert in the world, to make a report on the adoption of some

system of sanitation to meet the peculiar requirements of a great and growing commercial metropolis like Shanghai. Then whatever the cost, let the Ratepayers decide. If there are insurmountable engineering problems, and a better system cannot be adopted, then approach the Japanese concern and accept their offer, and invite the Chinese authorities of the Native City to do likewise.

In conclusion we again quote the significant words of our esteemed Health Officer: "When one recalls to memory the ghostly procession that yearly departs this life in Shanghai, or goes home physically wrecked from these causes," *and we add*, it is extraordinary that more attention is not given to this important matter by the *servants of the Ratepayers*, and steps taken which will abolish or at least minimize the constant peril to which the community is subjected through the continuance of the night soil traffic with the Chinese.

ASPHALT FROM THE PHILIPPINES

The discovery of a vein of asphalt of high quality and of large extent in the Philippine Islands is likely to have a marked influence upon the paving of cities in the Far East and upon other lines of building and contracting work. The vein has been discovered by a Government forester who took an outcrop of the vein on a hillside for coal. The deposit lies in the Leyte Province, barrio of Campopoc, on the northwest peninsula of the island about 10 miles from the ocean. The vein discovered runs about a yard and a half thick and can readily be traced about 160 yards along the side of the hill, several thousand tons of the material being actually in sight with indications that the deposit is of much greater scope. The analysis of the deposit made in Europe shows that it is of a quality suitable for the highest uses and ought to bring the highest prices. The discoverers of the vein are already using the material for roofing and similar purposes. Emanations of an oily nature in the country near the deposit have been noticed for many years and were supposed to indicate oil.

PROSPECTIVE BENEFITS

The successful application of this Philippine asphalt to paving and similar work will be of the highest importance, both to the Philippines and to other portions of the East. At present asphalt for paving, roofing, and other purposes is imported from Europe and the United States at high cost, the result being not only high priced pavements but a minimum of high grade material in construction of such pavements.

The Far East is just commencing to turn to modern pavements generally, and the use of asphalt heretofore has been quite limited. In Hongkong where, by reason of its peculiar location and the nature of its topography, road building has received particularly careful attention and has been the subject of considerable experimentation, little has been done in the use of asphalt until comparatively recently and the change has been due to the increasing use of motor cars and heavy traffic vehicles instead of the chairs and jinrickshas, which heretofore have made the use of macadam and of concrete and cement practicable. On the less frequently used roads and on the higher levels a concrete mixture of broken stone, a peculiar sticky Chinese clay and lime has usually been employed. As a result of the heavier demand upon the roads of the lower levels by motorcar traffic the need of a heavier binder for the broken stone has been seen and most of the better class pavements now being laid are of broken stone laid in asphalt or in tar.

The supply of asphalt in the Far East at present is coming largely from the west coast of the United States and the trade is increasing. Pavement grades of asphalt at present in Hongkong cost around $35 gold per ton, other grades running as high as $75 gold per ton, delivered in Hongkong in either case. In Hongkong little compressed asphalt has been used so far and that used has been imported through the Crown agents in London. Tar macadam is the chief pavement employed at present, but government engineers report that they expect to employ more compressed asphalt in the future.

THE PRITCHARD MORGAN CONCESSION

The London correspondent of the *Glasgow Herald* writing on August 5 says:—When the announcement was recently made that the Eastern Pioneer Company had secured from the Chinese Government an acknowledgment of what is known as the old Pritchard Morgan Claim in Szechuan, it was immediately followed by a message from Peking throwing doubt on the truth of the statement. I learn that the Foreign Office has now received information that the concession has been finally approved by President Yuan Shih-Kai. The President admits the validity of all contracts entered into by the Manchu Government, of which the charter granted to Pritchard Morgan in 1899 was one. The amended charter gives the British group the exclusive right of working in conjunction with the Chinese the vast oil resources of Szechuan, together with the mineral and industrial resources of the province, which is generally believed to be the richest in China. The grant of this concession means a great deal to British interests in the East. It means among other things that the province of Szechuan has passed to Great Britain. The very size of the concession made it appear hopeless to think that China ever seriously thought of granting it. The President's recognition of the claim, however, means that at one stroke Great Britain has secured practical control of the province, with its population of 60,000,000 and what is believed to be by far the richest agricultural, mining, and timber lands in the vast and rich territory of China.

STREET PAVING IN JAPANESE CITIES

By Consul General George H. Scidmore, Yokohama.

Modern street paving is as yet practically unknown throughout Japan The usual Japanese street has no sidewalk pavements, and no attempts have been made to provide separate roadways for pedestrians outside the business districts of the more important cities. These streets have no artificial pavings, they are usually macadamized in as cheap a way as possible, and are shockingly bad at all times of the year in the congested traffic districts. In the city of Tokyo, population some 2,000,000, there is only one steam roller employed on these pavings, and that is usually out of order.

In Yokohama a few of the business streets have cement sidewalks, but none of the streets are paved. Yokohama has a population of about 400,000 and street mileage about equal to that of any city of like population in the United States.

IMPROVEMENTS IN THE CAPITAL CITY

A few experiments in street paving have been carried on in Tokyo under supervision of the city authorities, but only a scant 3 miles have so far been paved, and this paving has been done with wooden blocks coated with a very thin covering of asphalt. The streets so paved are already showing signs of hard wear.

The main business street of Tokyo, the Ginza-dori, the Broadway of Japan, has cement sidewalks on both sides of the main roadway. The Ginza is a broad street and has a large traffic. The laying of cement sidewalks in Tokyo is gradually being extended and will undoubtedly be greatly augmented as the plan for widening the streets of the capital is gradually carried out. The rapid increase in traffic of all kinds, especially motor traffic, is playing havoc with the roadways, and the necessity for more durable pavings is becoming more and more apparent to the authorities. All the streets now paved with cement have cement curbings. I know of no residence streets paved, and few of them have special roadways for pedestrians.

POSSIBLE CONTRACTS—MUNICIPAL BONDS

There would be no prejudice on the part of the Japanese against an American corporation seeking street-paving contracts in Japan.

It is not absolutely necessary but it is always of advantage to a salesman who approaches Japanese officials if he is conversant with the Japanese language and has some knowledge of the intricacies of Japanese etiquette, which form so large a part of all Japanese social and business intercourse.

Municipal securities to cover municipal improvements are not issued by the Japanese municipalities without the approval of the Imperial Government. There are no securities as yet on the market for such purposes as street improvements. The city of Tokyo has at present a bond issue under contemplation for raising funds to install a modern sewer system, but this matter is as yet in abeyance. Should the large cities of the country, the centers of commercial enterprise, at any time see fit to undertake any extensive plan of street improvements they could doubtless stand the strain on their financial resources imposed by the undertaking.

The supply of materials, such as stone and sand, is easily obtainable in Japan. Hard rock is scarce, but gravel can be had in abundance throughout Japan.

PUBLIC WORKS AT KOBE—GENERAL SITUATION

Japanese cities are very backward with respect to municipal improvements as compared with American cities. There will be a large field in this direction some of these days, however, for American enterprise. There is no city in Japan with a sewage system and none that I know of in which the streets are lighted or paved. Just now the city of Kobe is engaged in two large works, the harbor works and waterworks, which have been lagging considerably for lack of funds. No city can undertake anything of this kind without the permission of the Central Government at Tokyo.

The incidence of taxation in Japan is very high while the wealth per capita is very low, and the Government at Tokyo has been making strenuous efforts at retrenchment in order to relieve the strain and adjust the finances. There is in this consular district one city of 1,250,000 inhabitants, three of about 450,000, and numerous smaller ones, so that when the time is judged favorable there will be a very large amount of this kind of work undertaken. I should advise Americans who are interested in these various lines to keep in touch with the general financial situation in Japan.

With regard to city roads, there are no curbs outside of the foreign concession, and they are only repaired with shingle from the seashore. This answers the purpose, after a fashion, as there is no heavy wheeled traffic, and consequently the need for pavement is not very pressing. One firm in Kobe laid down at its own expense a short strip of asphalt paving as an experiment, which induced the city to pave in this way the principal shopping street for a short way, and the tramway company has put down granite blocks in one particularly busy street.

THE PANAMA-PACIFIC INTERNATIONAL EXHIBITION

NOT AFFECTED BY EUROPEAN WAR

Special correspondence from San Francisco states:—Early in August in response to inquiries from all parts of the globe, the management of the Panama-Pacific International Exposition announced that the exposition would not be postponed. The development of events since that time, in their relation to the exposition, tends to confirm the wisdom of that original decision. When the decision was made no word had been received from any European nation as to what effect the European war would have upon its plans. In the last six weeks, however, it has become evident that many European nations will be represented at San Francisco.

So rapid has been the progress in the construction of the city of foreign government pavilions and palaces to the west and south of the Palace of Fine Arts during the first six weeks of the European war that each of them appears to be making an extra effort to surpass its neighbors. Of the 40 foreign governments which have committed themselves to participate, not one has withdrawn. On the contrary many have applied for more exhibit space and some have greatly increased their appropriations. Spain, France, Italy, Holland, Japan, China, Sweden, and other nations in the war zone have officially notified the exposition that they will proceed with their buildings or exhibits despite the war.

CONSTRUCTION PROGRESSING RAPIDLY.

The beautiful pavilions of Sweden, Bolivia, the Philippine Islands and Cuba are from 80 to 90 per cent. completed. Those of Honduras and Canada—the latter a huge structure to be filled wholly with displays from Canada and moving picture halls—are finished. The German Kali Syndicate building, constructed in part by the German government, is more than half finished, as is the Holland pavilion, which is set in a large garden. The huge Chinese building, as well as the two mosque-like buildings of the Ottoman Empire, are nearly half completed. The three government buildings of Japan, to be set in a four acre garden, are being built in Japan, to be sent "knocked down" and erected between the palaces of Cuba, Denmark and France, one of them being an ancient temple. Australia and New Zealand are rushing their buildings, which are over 25% completed. The Chilian and Peruvian buildings will flank that of New Zealand, while Italy, Brazil and Argentina surround Turkey on three sides.

LARGE FUNDS FOR PARTICIPATION

Within ten days after the war broke out Holland had increased its appropriation from $100,000 to $400,000 and ordered that construction be rushed upon the great Netherlands pavilion, immediately adjoining the Palace of Fine Arts.

The Persian display has been assembled at Teheran and is ready for shipment. Spain, which had not decided to participate officially before the war has since voted an initial fund, $100,000, for participation.

England, Germany and Austria will be represented by individual exhibitors or by associations of exhibitors. Norway is proceeding actively with her plans and Denmark broke ground for her pavilion the first week in September. The Argentine Republic, in view of the new trade alignments between the American continents, has increased its appropriation from $1,250,000 to $1,750,000; Italy has ordered construction rushed upon her great pavilion. Since the war broke out important publications in France have written the exposition for illustrations and data.

The Grand Duchy of Luxemburg despite the war has prepared and shipped a marvelous exhibit of unnamed roses to compete for the $1,000 prize for the Panama-Pacific International Exposition Rose. The Netherlands for its great government horticultural exhibit has asked for and has been granted 52,000 square feet of space and the plants are being assembled in seven different cities in Holland under the supervision of government experts. Japan has asked for 8,000 additional square feet of exhibit space for her horticultural exhibit, making altogether in the competitive horticultural exhibit a total of 12,000 square feet. This in addition to a four acre garden. Japan will be represented upon a vast scale in all the exhibit palaces. Cuba has asked for additional space and is making elaborate arrangements for her $250,000 display.

France cabled that her plans are unchanged. Aside from the action of the French Exposition Commission the Athletic Department of the exposition has received word from France that there will be a representation in the athletic events. Undoubtedly some of the entries on the athletic sports program will not be made and some of the art treasures intended for the Palace of Fine Arts will not be shown at San Francisco because of the war, but not by any means the majority or the most important of them, and there are many factors in the situation which will more than compensate for these losses.

Since the war broke out there has been a very sharp increase in the demand for exhibit space from the manufacturers of the United States, South America and the European nations not at war.

While there is now no doubt that many European nations will be represented at the exposition, it is apparent that in addition, there will be an unprecedented representation from South America and the Orient, as well as from Central America.

The exposition has become very important in an extraordinary economic situation. Manufacturers and exhibitors from South America and the Orient are preparing for a liberal representation. Cochin-China, Indo-China and Siam, the Philippines and many of the states of India and South Africa are beginning their preparations.

In regard to attendance traffic managers are of the opinion that the European war is likely to increase travel to California in 1915 rather than to reduce it.

SHIPBUILDING IN JAPAN

This year's operations of Japanese shipbuilding yards are beating all records. In 1912 and 1913, when the prosperity of the freight market reached its height, a large number of orders for ships were placed with different yards. The tendency was the same all over the world. In England the yards could not meet the increasing orders.

In Japan the demand was not so much in excess over the supply, but the increased orders have kept the different yards busy during 1914. There will be launched in Japan this year 17 vessels, with a total of 86,000 tons. The large additions to the mercantile fleet at a time when the market is so depressed are regarded with some apprehension.

SUGAR IN THE PHILIPPINES

The report of the San Carlos Milling Co. shows that the company's plant obtained during the year just closed 8,000 tons of sugar from approximately 5,000 acres. The land is owned by nine planters, seven of whom entered into contract with the company in advance to mill their cane, the two other planters coming in later in the year. This mill was built between July and December, 1913. It covers 20 acres, with the homes of the employees grouped about it. The supervisors are one American, one Japanese, and two Filipinos. The total force consists of 15 Americans, 200 Filipinos, and 7 Japanese.

The Seoul-Gensan Railway was formally opened on September 6. Its construction was begun during the late war but suspended until October, 1910, since which time the work has been carried on with vigour. The railway crosses the peninsula from east to west and is 141 miles in length.

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A LESSON OF THE WAR FOR AMERICANS AND FILIPINOS

To dwellers in the Far East, whose future prosperity and well being is linked with the progress of the countries wherein we reside and conduct our business, the Great War in Europe has emphasized the truth, that so long as the integrity and neutrality of weaker states is dependent on treaties and conventions, there can be no assurance of peace or protection against violent aggressions. The European war teaches us that neutrality treaties, or independence guarantees are not worth the paper they are written on, and are binding only on the weaker side. When the great armed Powers of the world consider that their interests demand it, and decide that the hour to strike has sounded, then treaties, conventions, understandings, and other solemn diplomatic contracts entered into with weak and defenseless governments, become simply waste paper, and no longer binding. The war has emphasized in no uncertain manner the expression of opinion on the "Philippine Problem" published in the October, 1913, issue of this paper. Our Filipino friends ridiculed the idea that they would not be safe under the protection of similar treaties which guaranteed to Belgium, Switzerland and Luxembourg their independence, and our remarks were construed as only another argument of a rabid American imperialist desirous of maintaining American control of the Islands, in violation of our pledged word.

For years a campaign of calumny and misrepresentation against the Americans has been openly waged by those Filipino politicians clamoring for Immediate Independence. Their cry has been heard at home by the anti-Imperialists, and answered by the National Democratic Party making it a political issue. For sixteen years the cry for Filipino Independence has unsettled American national politics, and acted as an obstacle to the development of the Islands. For many years a certain section of the Democratic party has demanded immediate withdrawal from the Islands, and if wiser and cooler counsels had not prevailed, the Islands to-day would have been staggering along under a feeble and impoverished native Government headed by politicians whose greatest ambition is to secure control of the finances and patronage of the Government.

We trust that the lesson of the war in Europe has struck home to those who have been loudest in condemning the policy of the American Government as expressed by the Republican administrations. The strong-armed attempt on the part of Austria to seize little Servia, as she had already annexed Bosnia and Herzegovina in violation of the provisions of the Belgian Congress; the brutal and cold-blooded violation of the neutrality treaties by Germany in respect to Belgium and Luxembourg; the arbitrary use of the Chinese Government Railways by Germany, for the transport of troops and war materials to strengthen Tsingtau, which in turn is employed as a reason by Japan in disregarding Chinese protests against a further violation of her neutrality; these and other incidents all point to only one great moral, and strengthen our previous remarks on the worthlessness of neutrality treaties and the hopelessness of weak nations relying on the honour of the stronger, when the interests of the latter are at stake.

Americans should be the first to take the lesson to heart, and commence at once to modify the present Democratic policy concerning the future disposition of the Philippine Islands. The provisions of the Democratic National Platform adopted at Baltimore, July 2, 1912, and now being carried into effect by President Wilson and Governor General Harrison, favor an immediate declaration of the Nation's purpose to recognize the independence of the Philippine Islands as soon as a stable government can be established, **such independence to be guaranteed by us until the neutralization of the Islands can be secured by treaty with other Powers.**

If it were not tragic, it would be to laugh. Such implicit, child-like confidence in the good intentions of the great military Powers of the world, indicates how little American politicians are informed as to the diplomatic undercurrents and trend of events in the Far East. As we pointed out a year ago, all the neutrality treaties in the world could not save the

Philippines from being acquired by some strong Power, within a few months after the American flag had been hauled down and the army transported back to America.

Yet, in deference to the peace proclivities of the Secretary of State and a firm desire on the part of President Wilson to stand loyally by his platform pledges responding to the wails of the Joneses and the little feeble hearted Americans allied with the anti-Imperialists; ignoring all the warnings which other American political leaders and statesmen have raised, the Democratic administration has persisted in its well meaning but mistaken policy of hastening the day of Filipino independence, and cutting the Islands adrift in the stormy seas of Far Eastern diplomacy, under the sole protection of a string of neutrality treaties with the other Powers.

How long would their independence have lasted if it had been conceded prior to August 1st. last of this year?

If the Democratic program could have been expeditiously carried out to suit the idea of Jones of Virginia and his friends, and the Islands had been cut adrift at ten o'clock on Wednesday morning or on any old day prior to August first, and safely established as a going republic under the proposed benevolent neutrality treaties, what flag would be flying over the Luneta in this month of October?

There is little to be gained in idle speculation as to the nationality of the war ships which would have been the first to arrive in Manila Bay. Any one of the great Powers now at war with each other, could conveniently justify their seizure or occupation of the Islands at this time, especially Germany, who on one historical occasion manifested a strong desire for their occupation. If not Germany, then Great Britain, France or Japan would have felt justified in swooping down and seizing the Islands, to prevent them being used as a base by the German war ships. And as Belgium, Luxembourg and poor old China have relied for their safety and security on a piece of paper, and have not the physical force to protect their integrity and neutrality, so the feeble and peaceable Filipino Republic within a few weeks after the outbreak of war, would have been seized, and occupied by some strong Power acting under the peculiar code of international morality which justifies such an outrage as necessary for its self-preservation.

The Democratic leaders and their anti-Imperialistic allies at home together with the Filipino politicos and all the Immediate Independence party, should get down on their knees and give thanks to the Almighty that the whirlwind campaign to give immediate independence to the Islands has been providentially delayed, and that the protecting flag of America still floats over Corregidor. If it had been lowered any time last year as so many prominent Democrats ardently desired, what would be the position of the United States to-day? Could we have bowed to the will of our "peace at any price" Secretary of State and remained indifferent to the fate of our Filipino protegé after so many years of sacrifice and labor and still have preserved our national honor? Would not the violation of Philippine neutrality have compelled us to dispatch a portion of our fleet to enforce the provisions of the treaties, and enter into hostilities with any Power who had occupied the Islands?

America has escaped this for the present, with no thanks to the Joneses and the Filipino demagogues, but just so sure as the present Democratic policy is adhered to, just so sure will America some day be forced to follow Britain's lead in maintaining by force of arms, the honour of her treaty obligations in respect to the Philippines. If this lesson of the great war is learned by Americans and Filipinos, and taken to heart, the Philippine problem will soon be solved. The American flag is the only safe guarantee for a permanent and peaceful government in the Philippines. This in turn holds good just so long as America has the power to enforce respect, and the spirit to exert this power when occasion demands. If the flag is once hauled down, and the little Island Republic cut adrift, with only its waste paper guarantees for protection, it will only be a question of time when America would be compelled to return and defend its protegé from the rapacity of some other power. We commend these thoughts to those editors of the Filipino and Katipunan Press who for years have carried on a seditious campaign under the noses of the good natured American authorities in Manila, and who have persisted in casting discredit on the work of their benefactors. Instead of the usual beauty and other contests for increasing circulation, let the following question sink deep in the minds of your readers in the form of a guessing contest. What flag would now be flying over the Island if independence had been secured two years ago, last year, or any time prior to August 1st? It would be curious and enlightening for the Americans to know just what the popular opinion of the Filipinos is as regards this interesting subject. We commend it also to the Joneses and the Democratic leaders in Washington. Ponder over it, and the more you ponder, the more will it be brought home, that to abandon the Philippines with only the safeguard of a worthless paper neutrality is simply to invite, well not to be explicit, let us say Patagonia or some other country of equal importance, to step in and undertake the responsibility which America shirked.

JAPAN AND THE SHANTUNG RAILWAY

The railway built by a German Company between Tsingtau and Tsinanfu, the capital of the province of Shantung, has been the bone of much contention between the Japanese and Chinese during the past month, and in the future is likely largely to figure in discussions relative to a settlement of the question of the eventual fate of the leased territory of Kiaochow. The investment of Tsingtau by the Japanese and British troops led naturally to a desire on the part of the Japanese to control such a vital means of communication with the capital of the province as was afforded by this railway; and the fact that it was the enemy's property and had been used by the enemy to transport munitions of war and men to the fortress gave them a certain amount of justification for over-riding the objections of the Chinese against occupation. China claimed from the outset that the railway was not German property under the domination of the State. She argued that it was the property of a private company in which Chinese were shareholders, and, therefore, could not be considered a prize of war, but her arguments were in vain. The Japanese had determined to occupy the line as a military necessity, and when protests began to rain upon her defended her action on the following grounds—which were set down in a Note from the Japanese Legation to the Chinese Government.

"The Shantung Railway concession was based on the concession granted to the German Government in the Kiaochow Convention of 1898. It is entirely and purely a German Company, possessing the nature of public property under direct control of the German Government, and is in reality a part of the Leased Territory, being an extension of it. According to the Company's Articles of Association and the Charter of the German Government under which it is worked, it is proved that it is a German Company. The above facts are indisputable. In view of the manner in which the railway is working it is impossible for it to be divided up, and the fact that a section of the line running to the west of Weihsien lies within neutral territory, cannot alter the original status of the railway, which still remains German. The Japanese Imperial Government having in view the complete demolition of the enemy's base at Tsingtau, in pursuance of the declaration of war against Germany, is quite justified in taking possession of the railway as it constitutes an indivisable part of the Leased Territory of Kiaochow. This can be accomplished without the matter being referred to the Chinese Government, but to avoid any misunderstanding and to avoid any chance of conflict with the local authorities, the Imperial Japanese Government has acquainted the Chinese Government of her intentions, and requests that China make such arrangements as will allow this to be done without further delay."

In explaining her views regarding the railway Japan pointed out that "The Shantung Railway cannot be regarded as neutral, and Japan's action in taking possession of it does not amount to a violation of China's neutrality. The proclamation of the Chinese Government defining the war zone does not in any way

alter the nature of this Railway's special status. The question of the war zone and the standing of the Shantung Railway are two separate problems and of a different nature. It was insisted by the Chinese Government that there is now no actual connection between Tsingtau and the railway line, owing to the investment of that place by Japanese military forces, and that there is no opportunity on the part of Germany to utilise the railway. But viewed from a Japanese military standpoint, governed by the situation in Shantung, it would indeed be very dangerous to leave in the hands of the enemy the section of the Railway west of Weihsien—just in the rear of the Japanese forces. It would be strategically impossible to permit such a thing. Examples are not lacking that the Chinese Government could not restrain the Germans from utilising the railway for warlike preparations and operations."

Upon these reasons Japan pursued her policy of establishing military guards along the railway as far as Tsinanfu, and installing a staff of trained railway men transferred from, it is stated, the South Manchurian railway system; and China has acquiesced in the occupation only under the strongest protest. The insistence by Japan of her right to occupy this railway caused considerable alarm in Chinese circles, and a certain amount of agitation was developed which culminated in members of the State Council at Peking interpellating the Government as to its policy regarding Shantung and the so-called "Japanese invasion." High officials, however, kept their heads, and paid no heed to the jingoistic utterances of some of the military representatives in the Council. The President and his immediate supporters all recognised the futility of resisting by force the violation of China's neutrality. They have painful knowledge that the Exchequer is empty of funds, and that the army is neither large enough nor equipped well enough even to hope to cope successfully with the force which the Japanese could employ by land, to say nothing of the possible operations from the sea; and for those reasons Chinese agitators wasted their breath in vain. The Government decided upon its line of policy immediately the European war showed signs of affecting this quarter of the globe, and that policy was simply to suffer "the slings and arrows of outrageous fortune;" to protest against any encroachment upon China's neutrality, and to trust in justice being done at the end of the war. Moreover the Government is willing for the time being to give Japan the benefit of the doubt by trusting that she really means to stand by her undertaking to respect the integrity of China. The Chinese man in the street thinks contrariwise. He holds the opinion that Japan has come into the province of Shantung to see and to conquer—and thence to spread what he calls "the continental policy." Only the future can tell whether there is wisdom in the man in the street of China, but it is only fair that Japan should at the moment be credited with the highest and best motives in her actions in Shantung.

The rights under which Germany built her fortress at Tsingtau and constructed the railway from Tsingtau to Tsinanfu were embodied in the Convention signed at Peking on March 6, 1898. The Chinese Emperor then engaged, while reserving all rights of sovereignty in a zone of 50 kilometres (100 Chinese li) surrounding the bay of Kiaochow at high-water, to permit the free passage of German troops within this zone at any time, and also agreed to abstain from issuing any Ordinances therein without the previous consent of the German Government. At the same time, "with the intention of meeting the legitimate desire of His Majesty the German Emperor, that Germany, like other powers, should hold a place on the Chinese coast for the repair and equipment of her ships, for the storage of materials and provisions for the same, and for other arrangements connected therewith, His Majesty the Emperor of China cedes to Germany on lease, provisionally for ninety-nine years, both sides of the entrance of the Bay of Kiaochow. Germany engages to construct, at a suitable moment, on the territory thus ceded, fortifications for the protection of the buildings to be constructed there and of the entrance to the harbour."

In Sections 2 and 3 of the Convention the Chinese Government sanctioned "the construction by Germany of two lines of railway in Shantung, the first to run from Kiaochow to Tsinanfu and to the boundary of Shantung Province, via Weihsien, Tsinchow, Pashan, Tsechuen and Suiping; and the second to connect Kiaochow with Chinchow, whence an extension will be constructed to Tsinan through Laiwuhsien." It was stipulated that a Chino-German Company should be formed to carry out this work; the profits derived from the working of the railways to be "justly divided pro rata between the shareholders without regard to nationality."

In addition to these specific railway rights—which were enlarged by an agreement signed at the end of 1913, and a further agreement signed on June 24, 1914,—the Chinese Government agreed to German subjects holding and developing mining property for a distance of 30 li from each side of the railways and along the whole extent of the lines, but these rights were subsequently modified when the extension of the railway agreement was negotiated. Germany, however, had the dominant voice in the province of Shantung with regard to the employment of foreign capital, the Convention setting out:—"The Chinese Government binds itself in all cases where foreign assistance in persons, capital or material, may be needed for any purpose whatever within the province of Shantung, to offer the said work or supplying of materials in the first instance to German manufacturers and merchants engaged in undertakings of the kind in question. In case German manufacturers and merchants are not inclined to undertake the performance of such works or the furnishing of materials, China shall then be at liberty to act as she pleases.

In pursuance of this Convention the German Government granted to a German Company known as the Schantung-Eisenbahn-Gesellschaft a Charter dated June 1, 1899, for the construction and operation of a railway from Tsingtau to Tsinanfu. The Charter stipulated that "the construction and maintenance of the railway shall be proceeded with by a German-Chinese Company," the management of the railway to be domiciled in Tsingtau, and the completion and opening of the line from Tsingtau to Tsinanfu to follow within a period of five years. German material was to be used as far as possible in the construction and equipment of the railway. It was stipulated that the company "shall pay a contribution from the yearly net profits of the railway to be applied to the expenditure of the Government for the harbor works in the Bay of Kaiochow and also to the general running expenses of the Protectorate," such contributions to be "the twentieth part of any surplus over 5 to 7 per cent., the tenth part of any surplus over 7 to 8 per cent., the fifth part of any surplus over 8 to 10 per cent. the third part of any surplus over 10 to 12 per cent., and the half of any surplus over 12 per cent." The German Government reserved the right to purchase the railway after the end of sixty years."

In addition to the railway from Tsingtau to Tsinanfu, the only one so far constructed, the Germans recently concluded an agreement with the Chinese Government whereby a line was to be built connecting Tsingtau with Hsuchowfu, on the Tientsin-Pukow railway, and another line extending from the Yellow River near Tsinanfu, to a point to be decided by survey on the Peking-Hankow railway. To this agreement no effect has been given, and what will become of it in the future remains to be seen. In the meantime the contention between Japan and China is confined to the Tsingtau-Tsinanfu line, the situation at the moment being that Japan has control of it under protest from China. Japan will no doubt operate the railway as efficiently as the South Manchurian railway is operated, and the bridges which were blown up by German employees of the line before their departure will soon be rebuilt and a restoration of traffic effected. Hitherto the administration of the railway was in the hands of the Germans, and by its temporary transference to the Japanese China actually loses nothing—except a little "face."

RUSSIAN RAILWAY PROJECTS

The acquirement from China by Russia of the right to construct a railway from Blagoveshchensk, on the left bank of the Amur River, to Aigun, Mergen, and Harbin, with a connection between Mergen and Tsitsihar, is of great importance politically to Russia and commercially to North Manchuria.

Commercially it taps large and rich tracts of territory and gives immediate access to the Amur River and to the New Amur railway now being opened on the left of the river, and with which Blagoveshchensk is connected. Politically it binds this region to Russia, and gives her at least railway dominance over the whole of North Manchuria. She now has the railway from Vladivostok through Manchuria and on to Russia, and has nearing completion the railway traversing her own territory from Vladivostok north of the Amur to Karimska, where it junctions with the Siberian railway. The railways she has now secured the right to build will permit her to place the important centre of Harbin, with its direct connection southwards, in immediate touch with trade avenues which will tap the large and it is reported resourceful territory of the Amur. Above all it places in the hands of Russia what is the northern section of the projected railway from Chinchow to Aigun, about which there was so much pother some years ago. Americans hold the right from China to build the Chinchow-Aigun railway, but in recent times the southern half of it, or practically the southern half of it, has been granted to Japan by China, and now Russia has obtained the right to cover the northern section. This seems to be tantamount to the theft of a man's clothes while he is asleep in the sun after a bathe—though it is folly for any man to risk sleeping under such conditions without keeping a taut string on his habiliments.

EXTENSION OF SHANGHAI SETTLEMENT

It is stated that at last an agreement has been arrived at in reference to the extension of the existing boundaries of the foreign Settlement of Shanghai. This matter was under discussion before the Revolution and several tentative efforts were made subsequently, without success, to reach some satisfactory understanding. One circumstance which has no doubt had considerable influence in preventing an earlier settlement of the question has been the constant change of officials who occupied the position of Commissioner for Foreign Affairs in Shanghai. The first occupant of the post after the Revolution was Mr. Wen Tsung-yao, who resigned after a few months. Mr. Ivan Chen, who succeeded him, was making satisfactory progress with the negotiations when he was sent on a mission to India in connection with the Tibetan question. Next came Dr. Chang, but he had hardly time to familiarise himself with the conditions at Shanghai before he was transferred to Wuhu. His successor was Mr. Yang Tcheng, and the appointment of an official of Mr. Yang's standing and experience, coupled with the fact that he was given the title of Special Envoy for Foreign Affairs, suggested that there would be some prospect of a termination of the negotiations which had been dragging on so long. These hopes have been realized, although it has taken a long time for matters to reach finality. We have authority for stating that a decision would probably have been arrived at earlier had it not been for the war, which moreover will prevent any actual transfer of the new territory until the conclusion of peace.

Although no official announcement has been made in regard to the area of the territory which will come under the influence of the Municipal Council, it is known that it is extensive. In the north-west the new boundary will be the Shanghai-Nanking Railway line, but the station and railway property will remain under the jurisdiction of the Chinese authorities. The selection of the railway as a boundary is certainly to be commended, as it provides a definite dividing line instead of the nebulous imaginary boundary that has, in the past, been so provocative of friction between the foreign and Chinese authorities. One of the arguments advanced by the Shanghai Municipal Council to support their claim for extension was that it was difficult to ensure satisfactory health conditions when insanitary dwellings were allowed to exist on the Chinese side of the boundary.

ECONOMIC PROGRESS IN JAPAN

The Financial and Economic Annual of Japan for 1914, issued by the Japanese Department of Finance, maintains the high level of excellence attained in previous years. In passing the hope may be expressed that the time is approaching when the Government of China will be able to present an equally comprehensive and authoritative report of the financial and economic activities of the Republic. Japan early recognised that it was of primary importance that trustworthy statistics showing the development of the country should be prepared and published, not only in Japanese, but in English, so as to make them available to the foreign elements which have a direct interest in Japan as subscribers to her loans. This necessity also exists in China, but hitherto it has been found impossible even to collect the statistics. There is some hope that, with a more settled condition of affairs, this unfortunate state of things will be rectified.

The general budget of Japan for the financial year 1913-14 called for a revenue and expenditure of Y586,807,588 (£60,105,253), but a supplementary budget brought this total up to Y594,416,770 (£60,884,643). The Government, however, decided to effect retrenchment in expenditures and to postpone undertakings, and a revised budget was prepared showing a total revenue of Y591,959,538 (£60,632,955) and a total expenditure of Y563,071,049 (£57,673,978), leaving a surplus of Y28,888,489 (£2,958,977). In the financial year 1912-13 there was an increase of Y38,000,000 (£3,892,246) in the ordinary section of the revenue as compared to the estimate, mainly due to increased revenue from Customs duties, income tax and sake tax. There were also increases in the stamp duties and in the receipts from Government undertakings and state property, mainly due to increased profits of the monopoly bureau and the steel foundry. The total increase in the ordinary section as compared to the estimates was Y49,480,000 (£5,068,114). In the extraordinary section there was a total increase of revenue of Y55,860,000 (£5,721,602). Thus the total revenue, ordinary and extraordinary, amounted to Y687,390,000 (£70,407,662) against the estimate of Y582,040,000 (£59,616,921), an excess of Y105,350,000 (£10,790,741).

In 1913-14 it is anticipated that there will be an excess in the ordinary section of revenue of Y42,000,000 (£4,301,956) and in the extraordinary section of Y85,000,000 (£8,706,340), mainly due to an increase in the surplus brought from the preceding year. The total revenue for the year, ordinary and extraordinary, will therefore be Y722,000,000 (£73,952,678), an excess of Y128,000,000 (£13,110,724) over the estimate. Although Y42,000,000 is given as the increase in ordinary revenue, there has to be a rectification, as there has been an increase of Y2,200,000 (£225,341) owing to administrative readjustment, and a decrease of Y9,000,000 (£921,843) as a result of the readjustment of the tax system. The total natural increase in the ordinary revenue would be Y49,000,000 (£5,018,949). As there was always a large surplus in the National Treasury the amount of treasury bills issued during the year was insignificant.

Turning to the economic side the first half of 1913 saw the issue in British and French markets of railway bills to the value of £1,500,000, railway notes of the same amount and exchequer bonds for Fcs. 200,000,000. With this foreign capital short-term railway bills to the value of Y65,000,000 (£6,657,790), which had been issued to meet railway expenses and other loans were redeemed. In June a general administrative reform was carried out, which was to produce a surplus of Y66,000,000 (£6,760,217) during the same financial year. Consequently during the second half year a steady improvement of the National Treasury began to set in and the Treasury bills which had been issued to the amount of Y35,000,000 (£3,584,964) during the first half year fell to Y20,000,000 (£2,048,551).

This reduction and the redemption of the short-term railway bills already referred to almost cleared away the short-term Government securities to the value of Y95,000,000 (£9,730,616). This facilitated the finding of capital in the economic world, but there was an increased demand for capital. This was due to the steady progress in organising new enterprises and expanding old ones; to the requirement of capital for settling the balance of foreign trade in which there had been an excess of imports to the value of Y90,000,000 (£9,218,478) in 1912 and 1913, and to the indirect effect of the tightening of the European money markets in consequence of the Balkan troubles. As a result of the increased demand for capital, the money market increased in

tightness with the exception of the changes in the rates of short-term interest. Deposits made in the banks at the principal trade centres of the country increased by Y39,000,000 (£3,994,674), which was no more than half the amount in the preceding year; the postal savings instead of the steady increase hitherto shown annually, were thrown into a state of suspension; the average amount for the year of the issue of convertible notes by the Bank of Japan was Y334,000,000 (£34,210,796), a falling off of Y12,000,000 (£1,229,130) compared with the preceding year, and at the same time the price of commodities in Tokyo showed a downward tendency. While the discount rate of the central bank was not changed, banks generally assumed a cautious attitude and the economic world experienced some difficulty in finding capital.

As a consequence capital required for newly projected enterprises fell from Y521,000,000 (£53,364,744) in the preceding year to Y380,000,000 (£38,922,462). The increase in the nominal capital of companies was Y271,000,000 (£27,757,861) against Y304,000,000 (£31,137,970) of the former year, and the issue of domestic debentures fell from Y92,000,000 (£9,423,283) to Y64,000,000 (£6,555, 362).

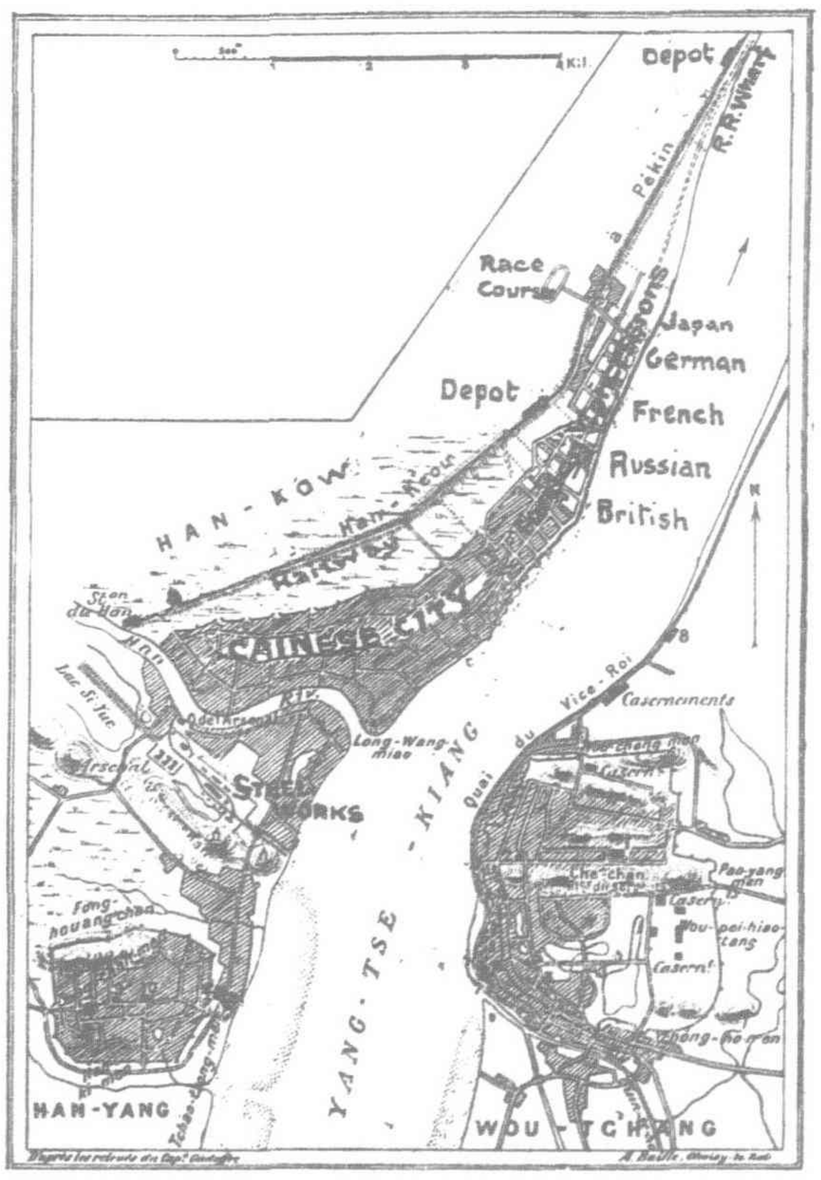
There was a considerable increase in imports on account of importation of foreign capital, progress of already projected enterprises and diminished output of local agricultural products in Hokkaido, the north-eastern provinces and Taiwan. Exports also increased in consequence of the economic condition in China and the increased demand for raw silk in Europe and America. The volume of import trade was Y729,000,000 (£74,669,671) which was Y110,000,000 (£11,267,029) more than the preceding year, while that of the export trade was Y632,000,000 (£64,734,201) an excess of Y105,000,000 (£10,754,891). Thus the total of foreign trade was Y1,361,000,000 (£139,403,872) an increase of Y215,000,000 (£22,021,919). Such prosperity was unprecedented, as never before had the foreign trade reached Y1,300,000,000 (£133,155,792) or both the export and import trade shown an increase of over Y100,000,000 (£10,242,753) in one year. As the currency had been reduced, prices gone down and the trade conditions since the beginning of 1914 had given promise of great improvement, the excess of Y96,000,000 (£9,833,043) in imports was not a matter for any great anxiety.

THE RECONSTRUCTION OF HANKOW

CHINA'S COMMERCIAL AND INDUSTRIAL CAPITAL

Ever since the fateful fire which destroyed the Chinese city of Hankow during the Revolution of 1911-12 it has been generally known that the Chinese Government has been desirous of rebuilding the city upon modern lines and making other improvements in the vicinity compatible with the importance of such a flourishing commercial and industrial centre. It was, therefore, not surprising when it became known that an agreement had been signed between the Central Government and Messrs. Samuel and Company, of London, on September 17 for a loan for this purpose. The Agreement provides that the loan, which is to be known as "The Hankow Improvement Loan," shall be for £10,000,000 at five per cent. interest, and shall be issued in one or more series at a rate to be determined upon by the parties after the conclusion of hostilities in Europe.

The object of the loan is to develop and improve the city of Hankow, and, in particular, to purchase and reclaim the necessary land for new roads and to construct roads; to construct a bridge or tunnel to connect the north bank of the Yangtze River with Wuchang; to construct a bridge, or bridges, to connect the cities of Hankow and Hanyang; to provide a tramway system; to construct a canal with the necessary bridges at the back of Hankow city between the Han and Yangtze Rivers; to build wharves; to provide funds for the purchase by the Government of the existing Electric Light and Waterworks Company's undertakings at Hankow; to provide such further improvements as may be found necessary to improve the city of Hankow, in accordance with modern practice (e.g. the construction of embankments, drainage schemes, etc.); to provide funds for the establishment and maintenance of the Hankow Improvement Bureau to be established by the Government for the administration of the Hankow Improvement Scheme, and for the purchase of all necessary equipment required by the same, also to provide for the establishment and maintenance of the necessary police force required owing to the extension of the city; and to furnish an adequate margin of funds to insure the maintenance of interest payments, pending the completion of the works.



The loan is to be guaranteed by the Central Government and in addition is to be secured by a first mortgage on the property purchased and created with the proceeds of the loan funds, and the revenues of undertakings initiated under the scheme. The period of the loan is to be forty-five years; the interest to be paid half-yearly. The Government will guarantee that the loan shall be free from all present and future Chinese taxes and imposts.

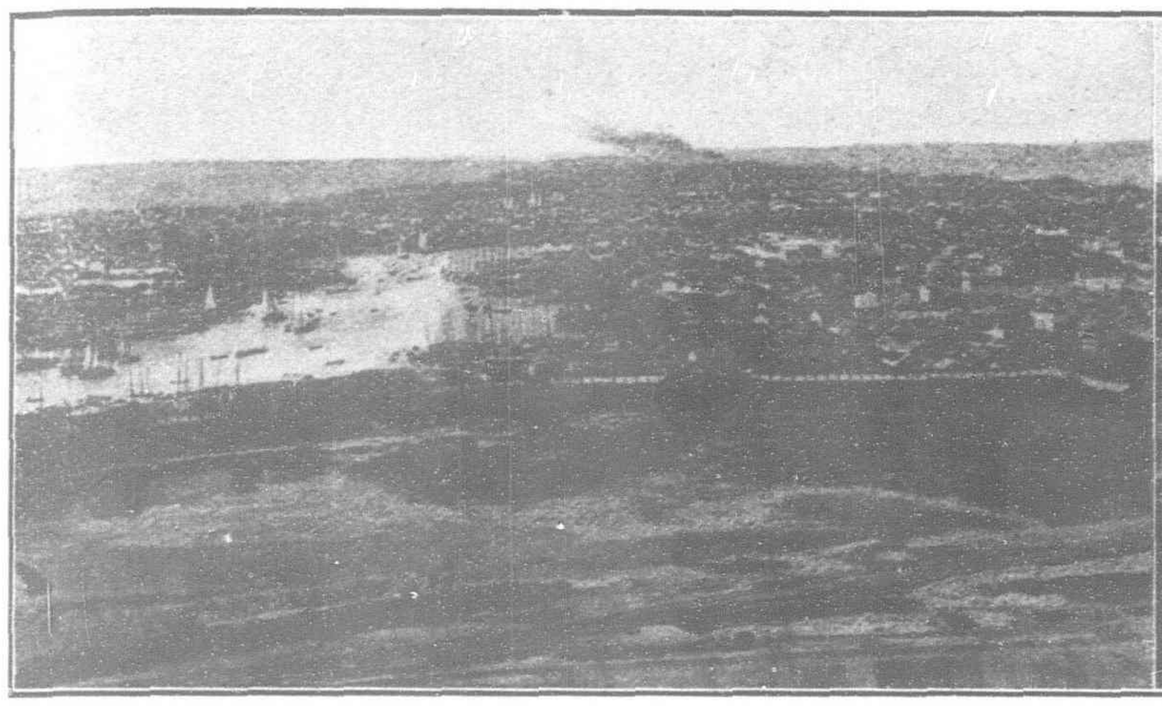
In order to insure judicious expenditure of the funds devoted to the purchase of land the Government and Messrs. Samuel and Company, Limited, will by mutual agreement appoint a commission under the presidency of the High Commissioner, and composed of two Chinese and two foreign members, to undertake the work, no purchases to be effected without the approval of a majority of the Commission.

The engineering work will be supervised by an Engineer who shall be an acknowledged expert in town planning, his appointment to be made by the Government with the approval of Messrs. Samuel and Co., Ltd. He will act as Engineer-in-Chief to the Hankow Improvement Bureau, and will make plans, estimates, and specifications; and generally advise the Bureau regarding the most suitable and economical methods of carrying out the work of remodelling the city of Hankow, building bridges, reclaiming land, installing a tramway system, etc.

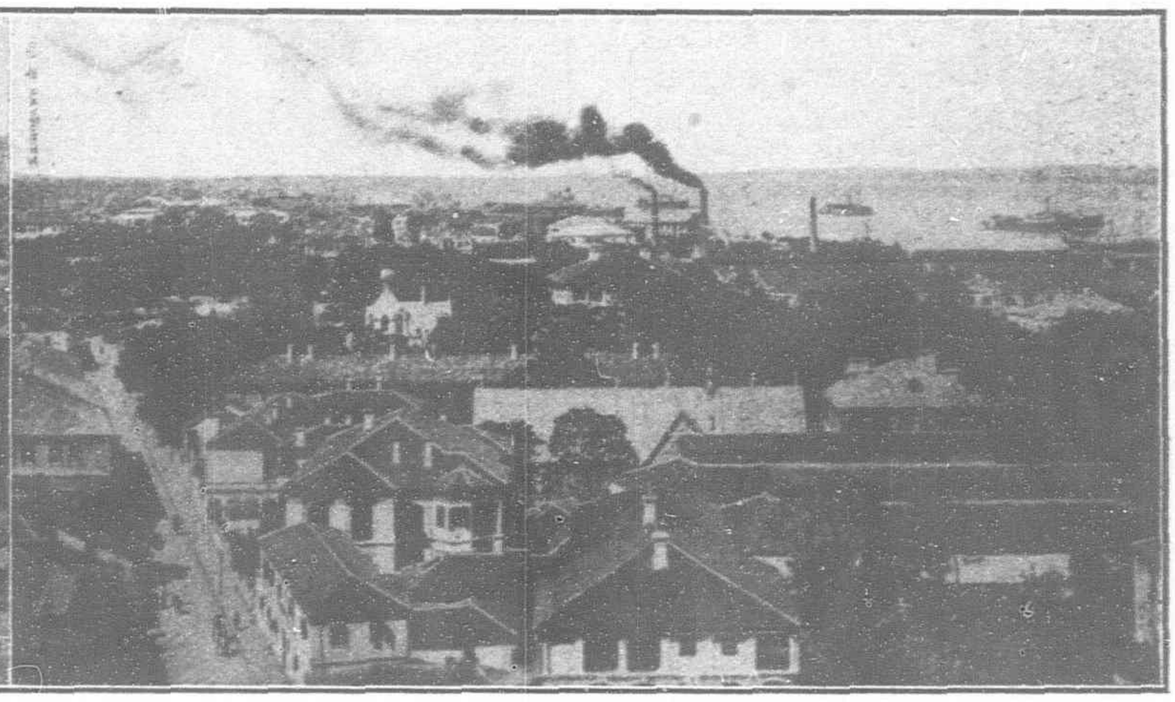
The agreement provides that in the purchase of materials Chinese materials shall, where possible, be specified, and, when materials of foreign manufacture are purchased British materials shall have the preference with due regard to quality and price.

How important it is that the Central Government should take advantage of the destruction wrought by the Revolution to

make of Hankow an up-to-date and efficiently equipped city can be gauged by a study of its location in relation to the rest of China and of the natural resources which are within reach for great industrial development. A glance at a map of China will show that it is placed in an extraordinarily favorable situation to command the trade of a vast portion of the Chinese Republic. It is situated on the great Yangtze River roughly at an equal distance from the north and south, and forms, or will form, the point of junction of the Peking-Hankow and Canton-Hankow railways and will be the point of radiation of other lines running into the province of Szechuan, and eastwards to the sea.



Hankow: The Han River.



Hankow: The Russian Concession.

On the opposite side of the Yangtze River is the Chinese city of Wuchang, famous as the starting point of the Revolution which resulted in the overthrow of the Manchus and the inauguration of the Republic, and on the opposite side of the Han River, which flows into the Yangtze River at this point, is the city of Hanyang, where is situated the Arsenal and Iron foundry.

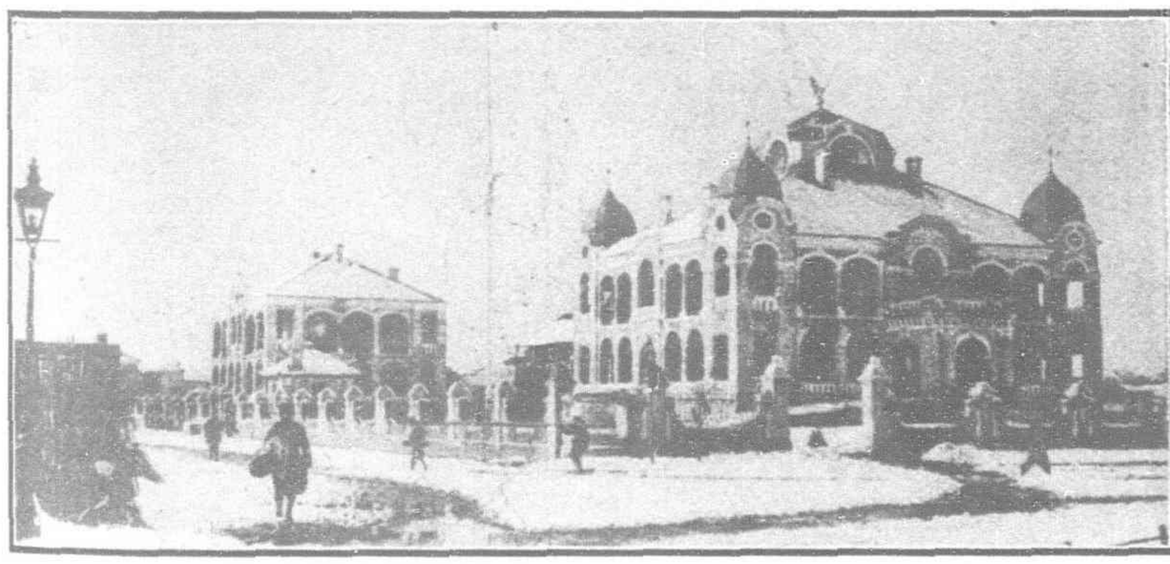
On the down-river side of Hankow native city, the one to be rebuilt, are the foreign concessions. They stretch along the left bank of the Yangtze and give an air of solid prosperity to the locality.

Wuchang is actually the capital of the province, and is a walled and fortified city with a population estimated at about 250,000. Though not officially opened to foreign trade its very propinquity to the open port of Hankow is bringing it into more intimate relations with foreign trade. It is the site, too, of some of the recent industrial undertakings of the Chinese, among which are the Wuchang woollen mill, the cotton mill, and Diederichsen's albumen factory.

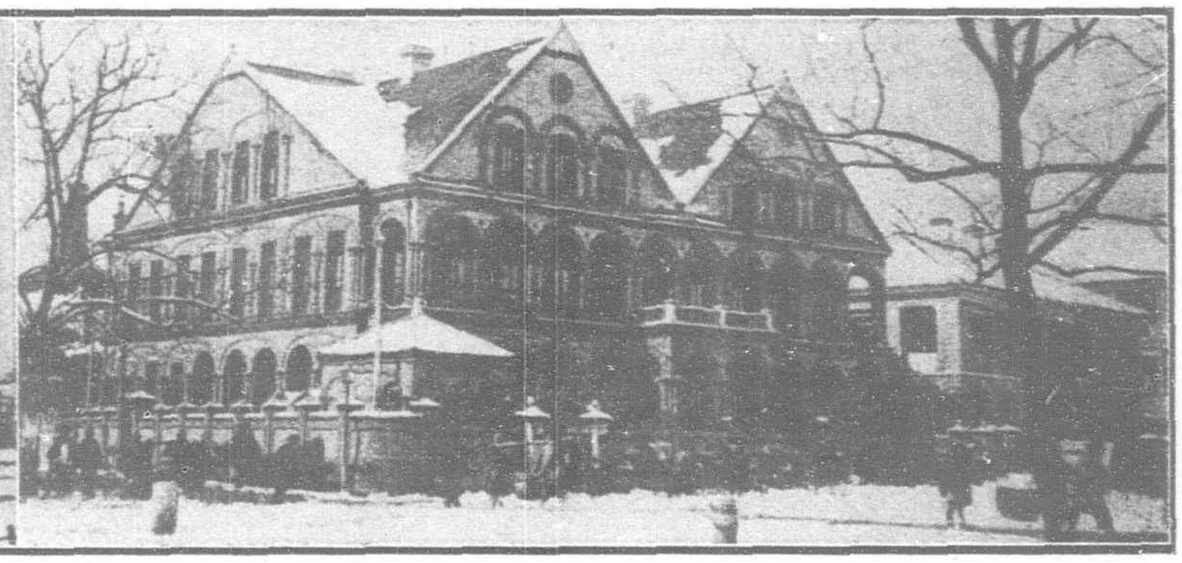
Wuchang is situated at the narrowest point of the Yangtze River, the stream being narrowed between two opposite heights, with Snake Hill on the Wuchang side and Tortoise Hill on the Hanyang side. The current of the river is restricted between these two low bluffs to a breadth of 3000 feet, and it is at this point that it is proposed to bridge the stream and by this means to bring the railways to the north and south into direct connection and thus to form an easy means of communication for the thousands of passengers who daily pass to and fro between the cities on the north and south banks of the river.

Slightly north-east of Wuchang, in the obtuse angle formed by the junction of the Yangtze and Han rivers is situated the port or "mart" of Hankow. The Chinese city is at the actual junction of the two rivers. Adjoining the Chinese city on the east we have the British, French, German and Japanese settlements, each facing the Yangtze River front, which is bunded for a distance of some three and a half miles.

Immediately opposite Wuchang, and in the acute angle formed by the junction of the Han River and the Yangtze, is situated the city of Hanyang, which takes its name from the two rivers. Its population may be estimated at approximately 70,000, and it owes its existence as a city to the location in this place of the Hanyang Iron works, founded by the late Chang Chih-tung. These iron works obtain their ore from the Tayeh mines, seven and a half miles south of the Yangtze, at a point seventy miles below Hankow, while coal comes from the Pinghsiang collieries in the province of Kiangsi, the three industries being combined in one joint stock company, the Hanyehping Coal and Iron Company. The Company's exports abroad in 1909 amounted to 37,600 tons and in 1910 to 63,700 tons. New machinery was installed to bring the output to 800 to 900 tons per day. The iron works have supplied many of the railways in China with rails, etc. The employees number some 40 Europeans and several thousand Chinese. In Hanyang there is also situated the Government Arsenal, where various types of arms are manufactured.



Hankow: The German Concession.

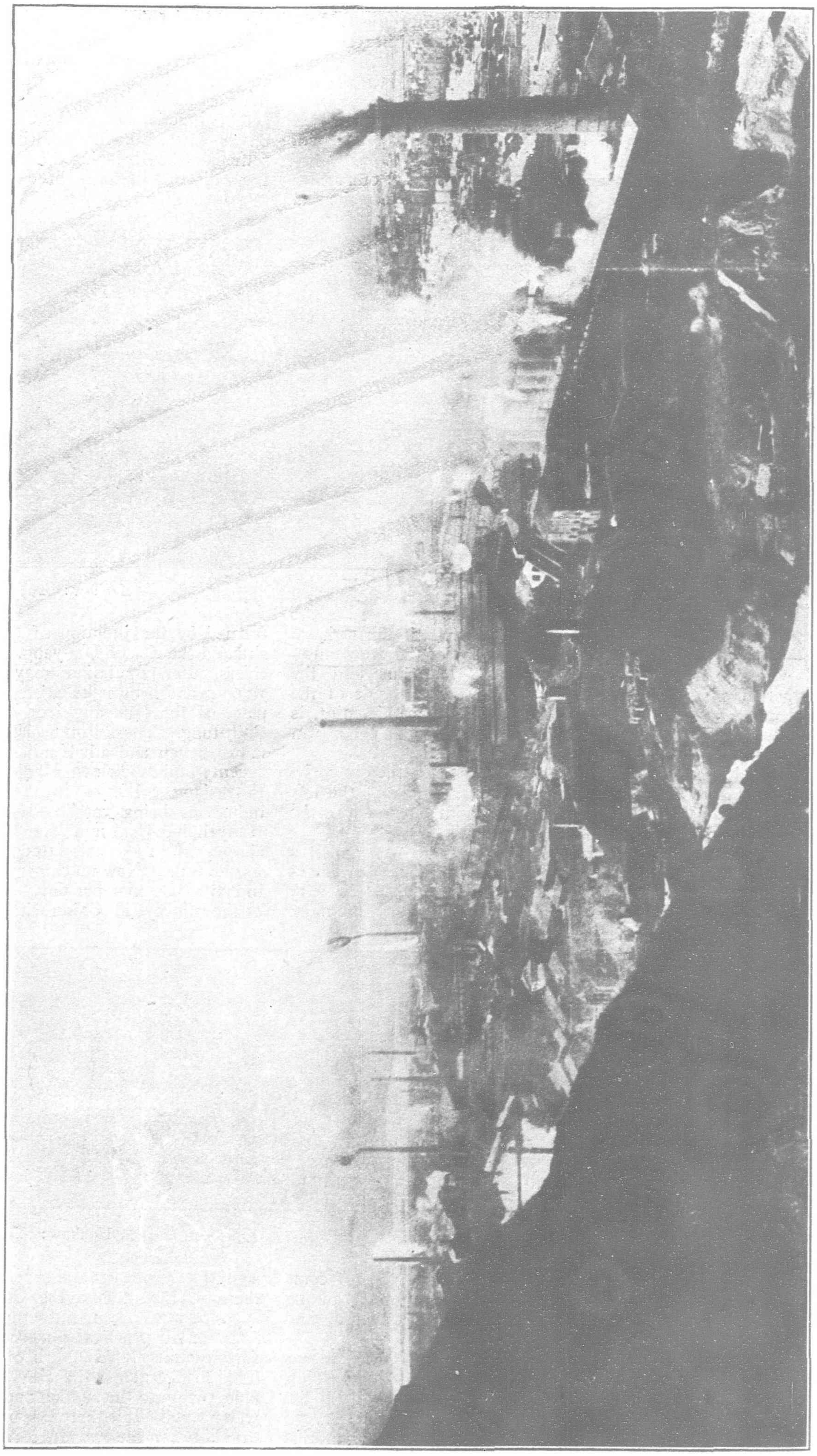


Hankow: Yokohama Specie Bank.

For all practical purposes Hanyang may be considered as forming merely a suburb of Hankow. The construction of a fixed bridge across the Han River will probably not be practicable, owing to the sudden and great changes in the height of the water level. It is therefore proposed to facilitate the communication between the two cities of Hanyang and Hankow by means of a transporter. When this is completed the three cities will practically be welded in one.

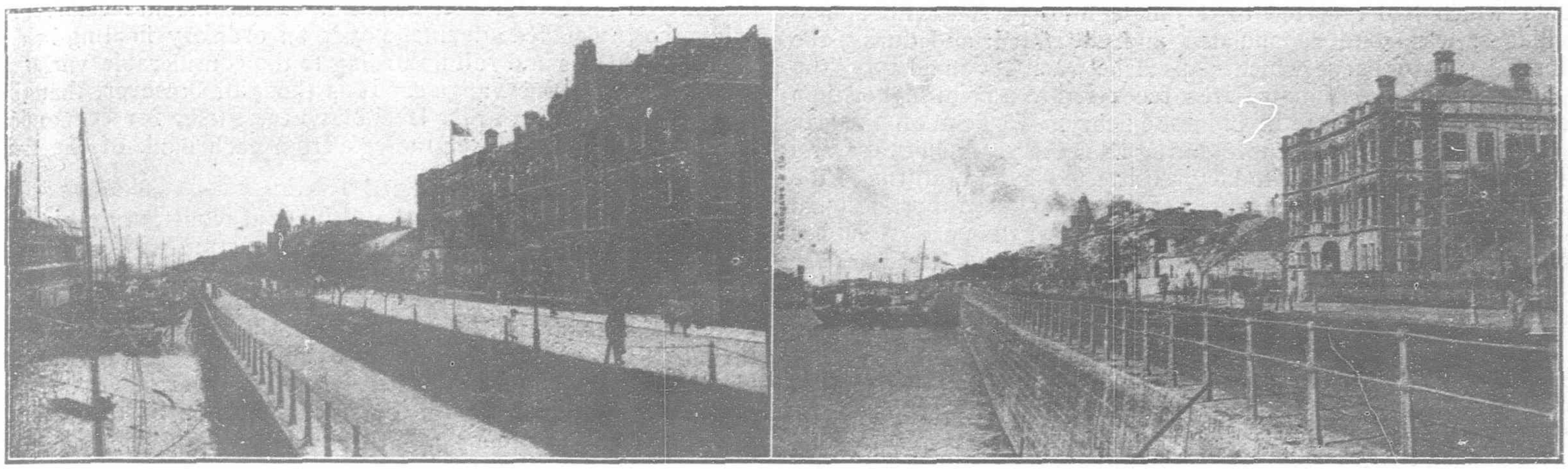
Even before the revolution it had long been apparent to the Chinese Government that the condition of the city of Hankow was unworthy of the premier industrial and trading centre of China, and still more so of the future development of Hankow as the strategic centre of the Chinese system of railways and waterways. The Han River was, and is, always choked by the enormous numbers of native craft plying upon it. Excepting for the wharves of the China Merchants Navigation Company, and those of Messrs. Butterfield and Swire, there are no facilities for loading and unloading goods from steamers in the native city, the only accommodation provided in this respect being situated in the foreign settlements. The Chinese city of Hankow, with its swarming population, was restricted to a very small area, with narrow, dirty, and insanitary streets. No proper provision for intercommunication existed between the three cities whose aggregate population was at least 1,400,000. No proper scheme existed for the extension of the city which must follow on the further opening up of China by railways, and the further increase in its foreign trade.

In 1911 the three cities formed the centre of the fighting between the Imperialists and the Revolutionists. The actual signal for the premature outbreak of the Revolution was given by the explosion of a bomb which occurred in a house in the Russian Settlement at Hankow. This led to the discovery of the plans of the revolutionists, who, seeing their plans exposed and having a large part of the garrison of Wuchang on their side, struck. In the fighting which ensued Hankow and Hanyang were taken and retaken by Imperialists and Revolutionists, while Wuchang remained in the hands of the Revolutionists throughout. Foreign settlements were respected by the belligerents and suffered no other damage than may have been done by a stray shell. On the final capture of the native city of Hankow by the Imperialists and before peace could put a stop to hostilities the city was burned to the ground, and upon its ashes the ultimately establish-



The Hanyang Iron and Steel Works.

ed Republican Government decided to build a city upon modern lines. However, their good intentions were frustrated owing to financial stringency and the Chinese began to rebuild of their own accord upon lines almost similar to the old conditions, though the roads have been considerably widened by the authorities refusing to issue building licenses except upon the understanding that buildings were to be set back three feet from their former site. Now that the Government has entered into an agreement with Messrs. Samuel and Company, Limited, steps will be taken, when the time arrives, to put into effect many improvements so that the city may take the place it ought to occupy as the leading commercial and industrial centre in China.

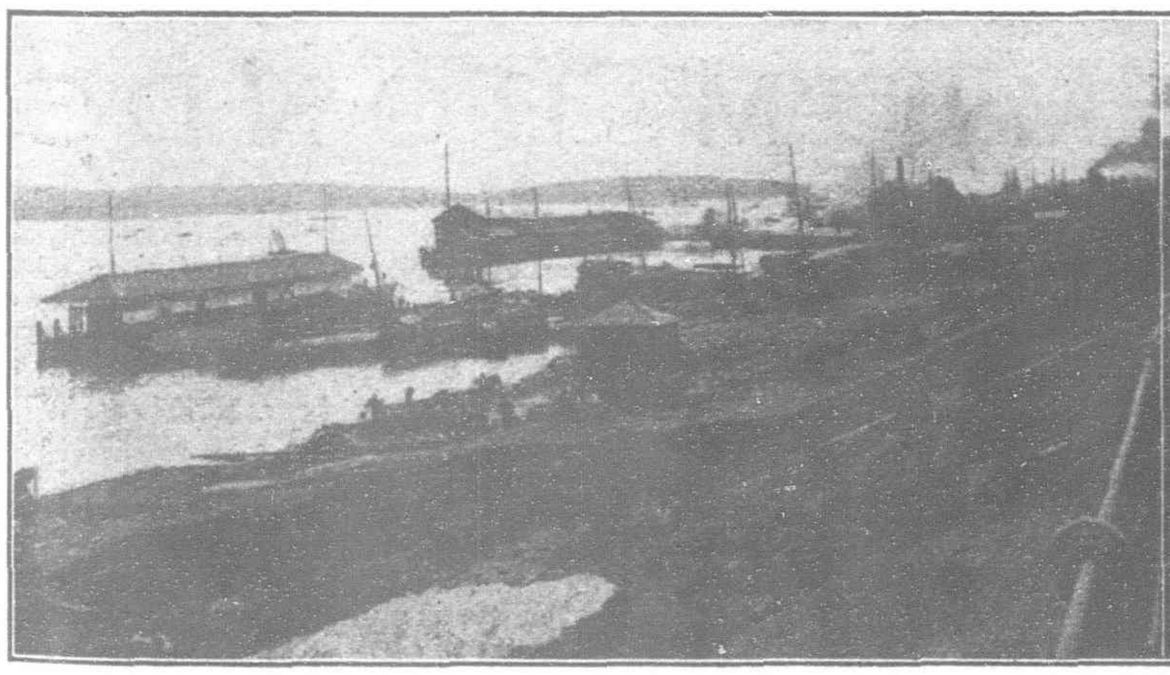


Hankow: The Bund.

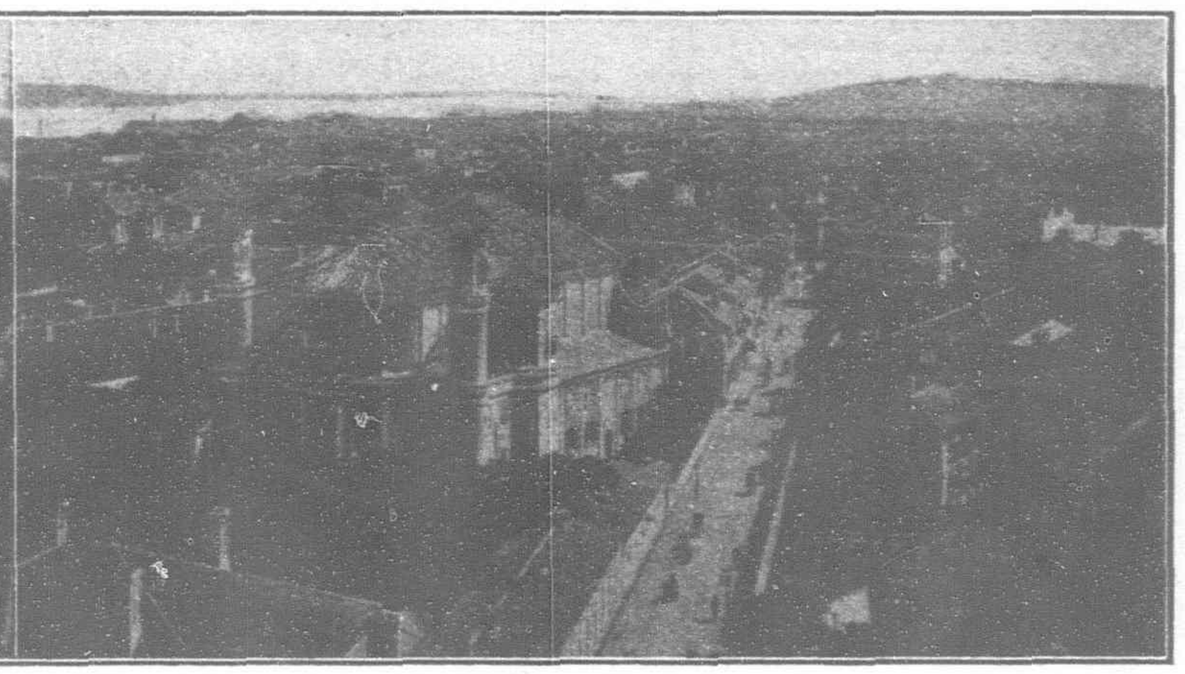
Trade to Hankow from the south now chiefly finds its way by various waterways to the Yangtze, but this trade will be greatly facilitated and augmented by the completion of the Canton-Hankow railway now in course of construction. A further link will be forged with western China by the completion in the next few years of the railway to Szechuan, a joint British, French, German and American enterprise, while further feeders such as the Shasi-Shingyi line are already contracted for or contemplated. The construction of the Sinyangchow-Pukow railway, being built with British capital, and other lines will also contribute to the growing trade of the city.

Disregarding for the moment the construction of these new methods of transportation which will facilitate the movement of goods and people along the already defined lines of travel in China it will be seen that Hankow commands the trade of the whole of central China moving along the waterways which form the main arteries of traffic. Thus it receives the whole of the river-borne trade from the provinces of Hupeh and Szechuan, which reaches Hankow along the Yangtze and its tributaries, and taps a region with a population of 78,110,000 for Szechuan, and 34,000,000 for Hupeh. The river Han, from which Hankow, meaning "Han mouth," takes its name, brings to it the trade from northern Hupeh, Honan, (with an estimated population of 22,100,000), and southern Shensi. The Tungting Lake and its feeders contribute the trade from the south of the province of Hupeh, the province of Hunan, (with an estimated population of 22,000,000), and part of the province of Kweichow. While Hankow is thus favorably situated for steamer traffic from the west of China, and from Hankow itself to the eastern provinces, it must be borne in mind that the city is the highest point on the Yangtze to which ocean going vessels of light draught can ascend at all times of the year, while during a very large portion of the year it is accessible to ocean-going steamers of the deepest draught. During the months of April to October, when the Yangtze is high, ocean-going steamers of 15,000 tons burden may be seen lying alongside the wharves of Hankow, 600 miles or more from the sea, while on one occasion the British first-class battleship "Glory" anchored off the bund.

Reliable statistics as to the population of Hankow, Hanyang, and Wuchang, of which it forms a portion, are not forthcoming. In Captain Blackiston's account of Hankow in his survey of the Yangtze River when the place was first opened to trade on the conclusion of the Treaty of Tientsin, 1860, we learn that the city was then already a place of great importance. This expedition commanded by Admiral Hope, ascended the Yangtze River for the purposes of survey, and in order to throw open to trade the ports of Chinkiang, Wuhu, Kiukiang, and Hankow, and to establish Consulates there. During the fifties and early sixties the whole of central China was ravaged by the Taiping rebels. Little was heard outside of China of the wholesale destruction of human life and property that occurred in the interior of the country during the years that the Taipings were in possession of most of the Yangtze region. The ravages of these rebels were only observed by foreigners in the vicinity of the then opened Treaty ports such as Shanghai; but after the rebellion was subdued by the exertions of Chinese statesmen, such as Tseng Kuo-fan



Hankow: The Bund at Low Tide.



Hankow: The British Concession.

and Li Hung-chang, with the co-operation of General Gordon, whose services were lent to the Chinese by the British Government, and on the opening of the Yangtze region as a result of the Treaty of Tientsin, it became apparent that the whole country, lately the most prosperous portion of the Chinese Empire, had been to a large extent depopulated. Reliable authorities have calculated the loss of life in China owing to the Taiping and the Mohammedan Rebellions at approximately 100,000,000—c.f. Putnam Weale in "Conflict of Colour."

No better instance of the extraordinary recuperative powers of the Chinese nation, and of the productiveness of the Yangtze region, can be adduced than the fact that in spite of this wholesale slaughter, the ruined cities were soon rebuilt, the countryside which had reverted to a jungle interspersed with ruined villages, was soon repopulated and cultivated, and during the forty years of peace which elapsed between 1860 and 1900, the population of the Yangtze area recovered to a point higher than it had ever attained to in Chinese history. Trade at all Yangtze ports showed a rising curve during all these years, but first and foremost the trade of Hankow, as attested by the returns of the Maritime Customs Revenue, increased out of all proportion to all others, owing to the exceptional situation of the port, which has been described as the Chicago of China. In the "China Year Book," 1913, the estimated population of Hankow, exclusive of the sister cities of Hanyang and Wuchang, is given as 826,000, while that of the province of Hupeh, of which Wuchang, with its sister cities of Hankow and Hanyang, is the capital, is given as 34,000,000 (Customs estimate, 1910, 34,000,000; Chinese official census, 1885, 33,600,000).

Thus we see Hankow as the trading portion of a group of three cities with a total population of something over 1,000,000, is situated in the strategic centre for trade purposes of the principal provinces of China, namely, Hupeh, Hunan, Honan, Szechuan, and Shensi, each of these provinces being equal in area and population to a European state of the first order. The aggregate population of these five provinces is not less than 158,000,000, or about the same as the combined population of Germany, France and the British Islands, with Belgium and Holland thrown in. Many of the provinces of China contribute to Hankow's import and export trade, and again a large portion of the trade contributed by the millions of inhabitants of Central Asia finds its outlet to the sea at Hankow, while their requirements are imported through the same avenue.

The Bridge Over The Yangtze.

In this suggested structure provision will be made for a roadway thirty feet wide, two six-feet wide cantilever pathways, and a single line of railway.

The type of bridge at present suggested is a constant level floating bridge some 3,750 feet long, provided with twin opening spans electricaliy operated, giving a clear waterway of not less than 200 feet for the passage of steamers plying between Hankow and Ichang, which are much smaller craft than those trading between Hankow and down-river ports.

It is considered that a structure of this particular type has many advantages in overcoming some of the difficulties in foundation works. The general idea embodied in this important structure was detailed in one of the competitive designs for a bridge over the Hooghly at Calcutta. The constant level floating bridge has a decided advantage over an ordinary floating bridge which would rise and fall according to the considerable variation of the level on the Yangtze. It is thought, however, that this extreme variation in water level may necessitate, for economical reasons, having moderate gradings from each bank of the river towards the centre of the bridge.

In order to maintain the bridge at constant levels the submerged pontoons carrying the superstructure will be anchored down at and below the low water level of the river by means of tension rods, which will, in turn, be attached to groups of cylinders sunk deeply into the bed of the river. Consequently there is always an upward pressure exerted by the pontoons, and the stress in the above-mentioned tension members never becomes zero and is only reduced by the full application of the external load which the bridge is designed to carry.

It is estimated that one group of steel cylinders forming a "foundation" to sustain the upward pull as a swing span would entail the use of some twenty cylinders not less than 16 feet in diameter, while the ordinary fixed span groups for the same purpose would each need twenty cylinders not less than 10 feet in diameter as a foundation. The submerged pontoons providing the floating power to carry the superstructure would be of considerable length and diameter, strongly framed internally and divided into numerous watertight compartments. Provision will be made to remove cylinders for repairs as necessity arises. Until the necessary investigations at the site are concluded it is impossible to indicate more than the present general intention of those responsible for carrying into actual effect this large and much needed bridge, which will certainly rank as an undertaking of the first magnitude, involving as it will considerable engineering difficulties.

CHINESE PREMIUM BONDS

An interesting experiment is being made in China in the direction of sanctioning the issue of premium bonds. Premium bonds differ from the ordinary bonds in that instead of carrying the market rate of interest, they pay a smaller rate but some of the holders win premiums ranging from a considerable amount. In other cases the bonds carry no interest at all, but a large number of premiums is given and bonds that are drawn without winning a Premium are redeemed at par. This appears to be the method adopted by the Hsin Hua Savings Bank which is to issue bonds by permission of the Chinese Government. Regulations governing the procedure for the sale of these bonds have been drawn up, and the following is a translation :—

Regulations for Offices

1.—The General Office shall be established in the building of the Hsin Hua Savings Bank in Peking and it shall be organised by the representatives of the Telegraph and Post Department or the Postal Accounts Department of the Ministry of Communications, the General Post Office, the Bank of China, the Bank of Communications and the representatives of this Bank.

2.—There shall be one provincial agent office in each province and it may be located either in the provincial capital or in a commercial port which shall be decided by the General Office. The Bank of China, the Bank of Communications and the Telegraph and Post Offices of the province shall elect the agent among themselves. After the election is made, the General Office shall issue an official letter of authority to the agent.

3.—The number of branch agent offices to be established shall be decided by the provincial office and the Bank of China or the Bank of Communications, or the Telegraph or the Post Office may become the agent. The Bank of China or the Bank of Communications shall have the privilege of becoming the agent at their option.

4.—The provincial agent office shall be under the control of the General Office and the branch agent offices shall be controlled by the provincial Office.

5.—The duty of the agent offices shall be as follows :—

(*a*) To proclaim the regulations.
(*b*) To persuade the people to buy the premium bonds.
(*c*) To take charge of the distribution of lottery bonus.
(*d*) To take charge of the repayment of the capital when due.
(*e*) To announce the winning lottery numbers.

6.—The agent offices shall do their best to give information on all matters to the inquirers.

7.—The agent offices shall pay without delay when bond holders ask for the payment of the lottery bonus or the capital invested. A commission of 5% may be charged for the lottery bonus above the 8th grade. No discount is allowed to be made on the lottery bonus below the 8th grade.

8.—The branch agent offices may cash at the provincial office the lottery bonus or the capital paid by them upon the presentation of the

bonds at any time. The provincial office shall report every month to the General Office the amount of payments made by it or by the branch offices.

9.—The agent offices shall immediately stamp the bonds after payment so as to cancel them. The stamped bonds are to be returned to the General Office once every month.

10.—The Bank of China, the Bank of Communications, and the Telegraph and Post Offices of those places where there are yet no agent offices, shall also give their service according to clauses (a) and (b) of Article 5, and they shall do their best to give information to inquirers.

11.—Any amendments of the regulations will be announced by public notice.

It is provided also that individual persons may become agents for the sale of the premium bonds under the control of the branch agent offices, and individual persons may enter into agreement with the General Office to become agents. Where an individual person is agent there shall be no agent office.

Regulations Governing Issue

1.—The premium bond is to be issued by the Hsin Hua Savings Bank with the permission of the Government.

2.—The repayment of the capital of the premium bonds and the payment of the lottery premium is guaranteed by the Government.

3.—One premium bond shall be worth $10 and this is to be divided into ten coupons of $1 each.

4.—The amount of every issue of premium bonds shall be 1,000,000 bonds or 10,000,000 coupons.

5.—There shall be one issue of premium bonds every year.

6.—The repayment of the capital of the premium bonds shall be made at the end of the third year. The date of repayment shall be marked on the face of the bonds. But holders who get the chances shall receive the premium on the presentation of the bonds but shall receive no payment of their capital.

7.—Instead of paying interest there will be the payment of premium by means of lottery. The lottery shall take place once a year and there shall also be the payment of premium once a year.

8.—The date and the place of lottery shall be decided at time of the issue of the premium bonds and shall be printed on the face of the bonds. No change is allowed under any circumstance.

9.—The opening of the lottery shall be made before the public and the Government shall appoint two censors, the Ministry of Finance shall appoint one Superintendent, and the General Chamber of Commerce of the locality shall elect two representatives to supervise the opening of the lottery.

10.—Three lotteries shall be made for every issue of premium bonds. One lottery is to be made every year. Those who had already obtained the premiums shall have no more drawing. There will be 5,000 prizes or 5,000 bonds or 50,000 coupons. Their amounts are as follow:—

1st prize, $100,000 for every bond or $10,000 for every coupon.
2nd prize, $40,000 for every bond or $ 4,000 for every coupon.
3rd prize, $30,000 for every bond or $ 3,000 for every coupon.
4th prize, $20,000 for every bond or $ 2,000 for every coupon.
5th prize, $10,000 for every bond or $ 1,000 for every coupon.
6th prize, two bonds of $5,000 each or $500 for every coupon.
7th prize, six bonds of $2,500 each or $250 for every coupon.
8th prize, thirty bonds of $1,000 each or $100 for every coupon.
9th prize, sixty bonds of $500 each or $50 for every coupon.
10th prize, three hundred bonds of $250 each or $25 for every coupon.
11th prize, six hundred bonds of $100 each or $10 for each coupon.
12th prize, 1,000 bonds of $50 each or $5 for every coupon.

There will be 999 bonds of $40 each or $4 for each coupon for the bonds which have the same numbers as that of the last three denominations of the bonds of the 1st prize, 999 bonds of $30 each or $3 for every coupon for the bonds with the last three numbers same as the bonds of the 2nd prize; 999 bonds of $20 each or $2 for the bonds with the last three numbers same as the bonds of the 3rd grade.

The total number of bonds is to be 50,000 and the total amount of premium is $550,910.

11.—The payment of the premium or the repayment of the capital will be made on presentation of the bonds so that no registration of missing bonds will be made.

12.—The regulations of the bank shall be observed respecting the employment of the money obtained by the sale of premium bonds. The Government may at any time appoint special officials to supervise the Bank

13.—The 1st, 2nd, 3rd, and 4th prizes shall be paid by the Hsin Hua Savings Bank in Peking and the prizes below the 5th grade shall be paid by the offices of the Hsin Hua Savings Bank by which the bonds are sold or by the Banks of China and Communications or the Telegraph or Post Offices.

14.—The prize winner shall obtain the prize within one year dating from the date on which the lottery was opened. After the time limit prizes will not be paid.

15.—Bond holders who fail to get any prize after three drawings of the lottery, shall get their capital at the Hsin Hua Savings Bank or the Banks of China or Communications or the Telegraph or Post Offices within one year dating from the time when bonds become due. No capital will be paid after that time.

16.—The Bank shall be the Chief Office for the issue of the premium bonds and the Banks of China and Communications and the telegraph and Post Offices shall be the agencies. The Chief Office shall be supervized by an official of the Ministry of Finance. The regulations governing the agent office shall be fixed separately.

17.—Any person desiring to be agent for bonds may apply to the Chief Office or the agent offices. Regulations governing such agents shall be filed separately.

18.—If the bonds are not wholly sold at the time when the lottery is to be drawn at the first year, the prize numbers will be fixed according to the number of bonds sold and the prizes are to be given in accordance with Article 10th. This arrangement shall be followed at the time of drawing the lottery at the 2nd or 3rd year.

19.—Any amendment of the regulations shall be decided by the Board of Committee of the Bank with the approval of the Ministry of Finance.

THE PENSHIHU COLLIERY

According to the *Manchuria Daily News* the first smeltery at the Penshihu Colliery is approaching completion. The principal machinery was expected from abroad by September at the latest, and it was intended to complete its installation during October so that the smelting work might be begun during the current year. The European war it is feared will interfere with the execution of the Company's orders. Part of the machinery is already on the way on board a steamer, but there is no knowing what will happen thereto. The prolongation of the war will retard the installation of not only the first smeltery, but also the second and third, arrangements for which had already been concluded at an earlier date.

PETROLEUM IN BRUNEI

In the report of the State of Brunei for 1913 the Resident, Mr. F. W. Douglas says:

The prospects of a petroleum field being discovered at no distant date within the boundaries of the State have largely increased during the year. There are at the present moment three companies interested.

At Jerudong the Shanghai-Langkat continue their boring. Frequent mishaps to machinery and an apparently inadequate supply of spares and suitable repairing apparatus render break-downs of frequent and continuing occurrence. No very promising results have hitherto been reported or, for that matter, appear probable. The company pursues its policy of drilling one very deep well in the hope of meeting oil.

From the Tutong river running northeast, the Anglo-Saxon Petroleum Company has recently taken out a prospecting licence and its Geologist has spent some months in exploring the numerous secpages reported. It is, as yet, too early to form any opinion as to the ultimate success or failure of the company's operations in this locality.

At Blait the British Borneo Petroleum Syndicate, Limited, took over the interests of the Borneo and Burma Petroleum Syndicate. Operations were energetically carried on and, in view of the grave difficulties encountered, first at the Blait River bar, then in transporting boilers, machinery and casings through miles of waterlogged jungle, and finally in making earth roads now across swamps, then along the sides of precipitous jungle clad hills, nothing but praise can be awarded to the perseverance shown.

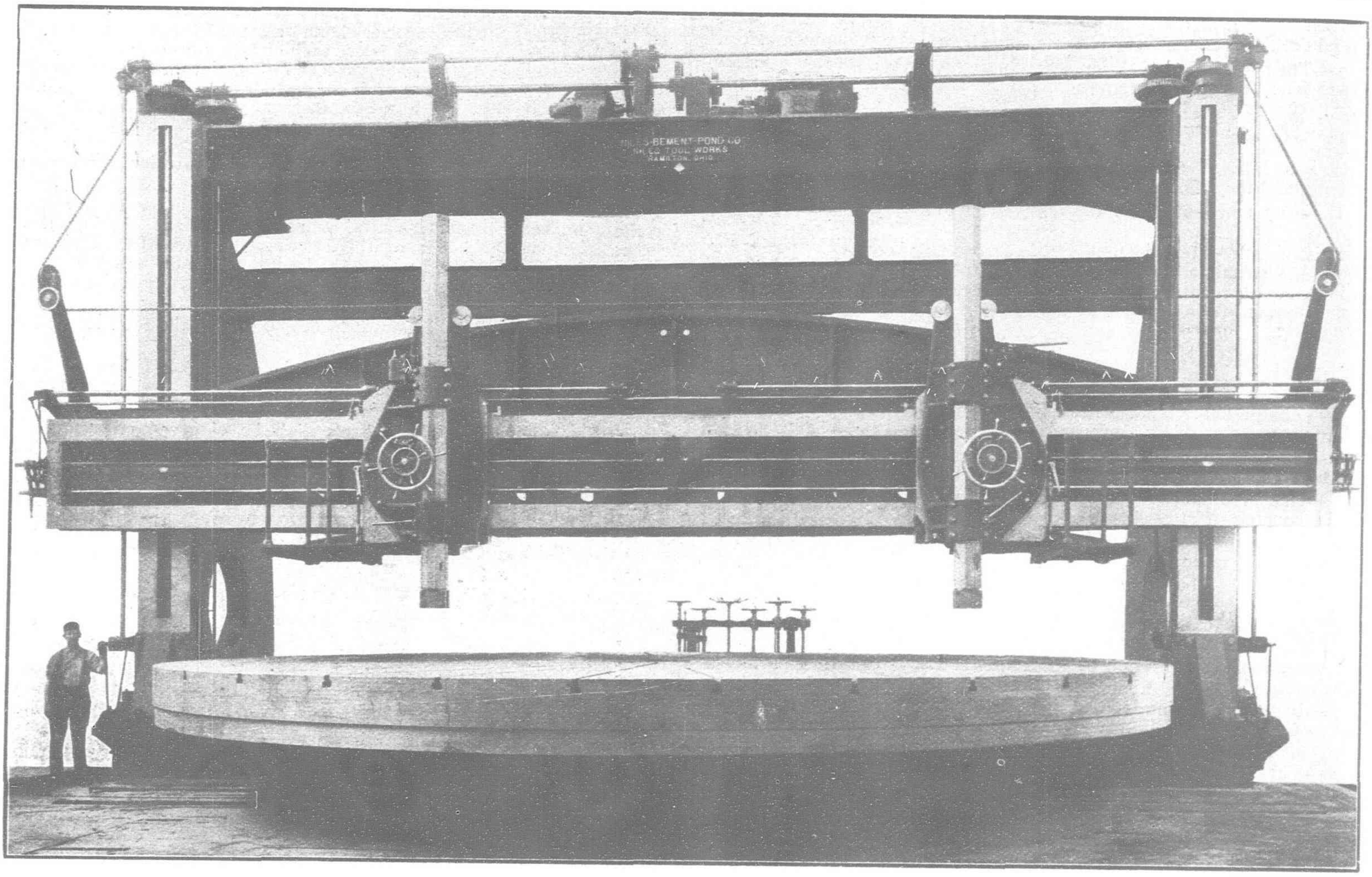
The demarcation of the various areas applied for under the prospecting licence was undertaken; and finally eight lease areas aggregating over eighteen square miles were surveyed. The work was exceptionally exacting and told severely on all the demarcators and coolies employed.

I took over the surveyed areas and picked up the boundary stones round the outer sides of the various blocks towards the end of August: and leases will shortly be engrossed for issue.

TO LINK SINGAPORE AND THE PENINSULA

Ten spans, each 313 feet long, are suggested as the most suitable for the big bridge with which it is proposed to link Singapore Island with the mainland of the Malay Peninsula. Thus, if the scheme matures, the new bridge will be one of the longest in any of the colonies. The designers, says the "Colonial Journal," are faced with a peculiarly complex problem. Not only is the bridge of unusual length, but the borings, contrary to expectation, have shown the strata to be, at any rate in places, unreliable, their composition being similar to that which caused considerable trouble during the construction of the new docks at Singapore. Then, for navigation purposes, a swing-open must be included or, at least, a bascule opening at one end of the bridge. Provision in the design has moreover to be made for carrying two 3 feet diameter mains across the Straits. The weight of the water alone in these two pipes will be 1,090 tons although this of course will be spread over the whole length of the bridge.

In view of these difficulties, it was at one time thought feasible to substitute a rubble mound, leaving gaps for water traffic. This had to be negatived on the score of cost and also by reason of the current in the Straits, which is at times as much as five miles per hour, and would be much greater if the waterway were restricted. Alternative estimates have been prepared for the bridge, but in view of the very heavy outlay involved, it is probable that a little more money will be spent in further investigations in order to secure, if possible, a site giving less water and more trustworthy strata.



LARGEST BORING MILL EVER BUILT IN AMERICA

At the Brooklyn Navy Yard, there has recently been completed the installation of the largest Boring Mill that has ever been built in America. This Mill was made by the Niles-Bemont-Pond Company, at the Niles Works, Hamilton, Ohio.

It swings 36′ in diameter and has 12′ under tools. The great swing of this machine is required for finishing the tracks of the immense turrets carrying the 14 and 16 inch guns of the new battleships. The Mill will also be used for boring cylinders and machining casings of the giant steam turbines for our war vessels.

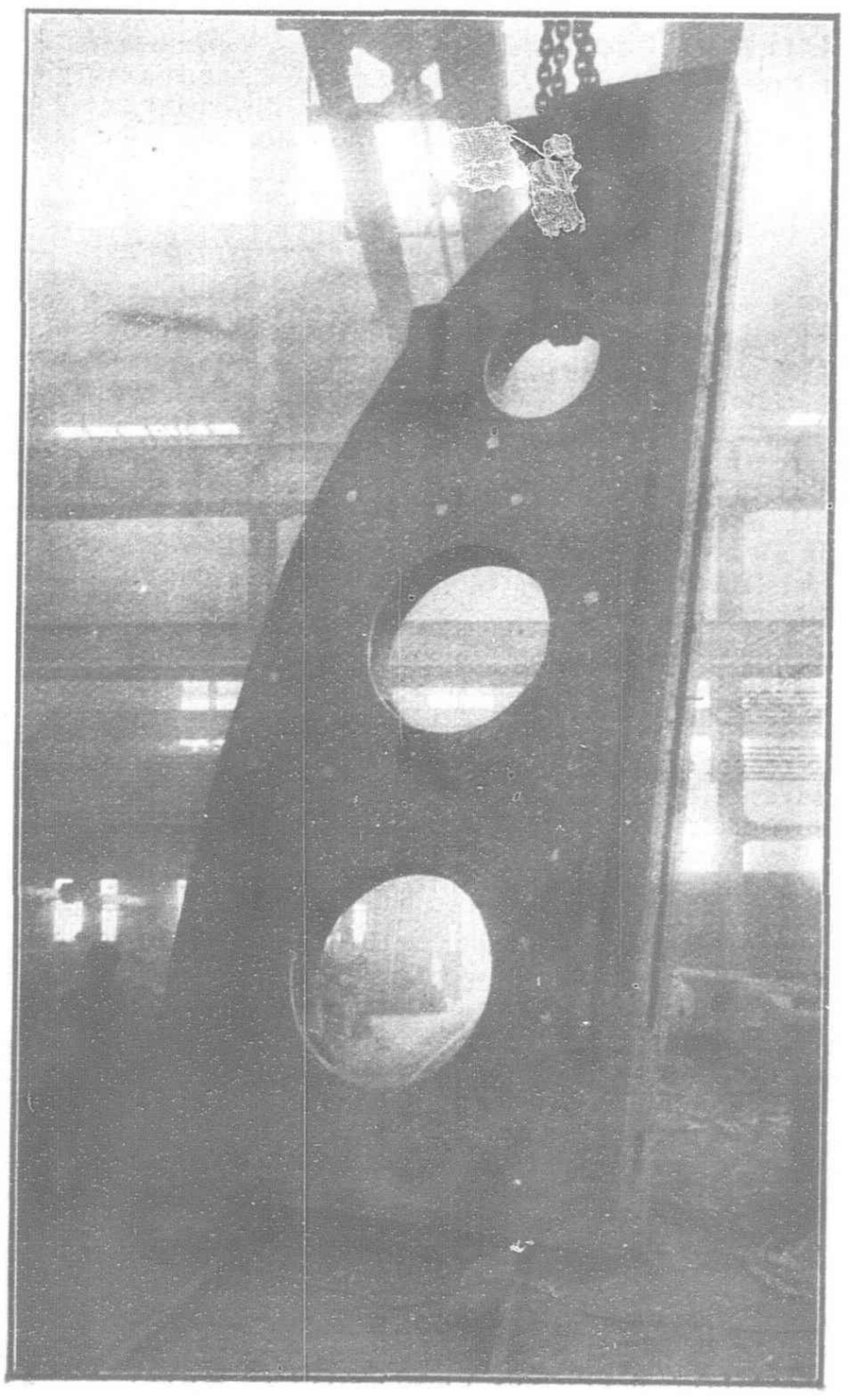
The significant feature about the size of this Mill is that it is not of the so-called "extension" type, but it is a regular cross-rail machine with an actual swing of 36 ft. 2 inches with the housings in a fixed position.

An idea of the size and massiveness can be gained from the fact that the total net weight including motors is 665,000 lbs. or over 330 tons.

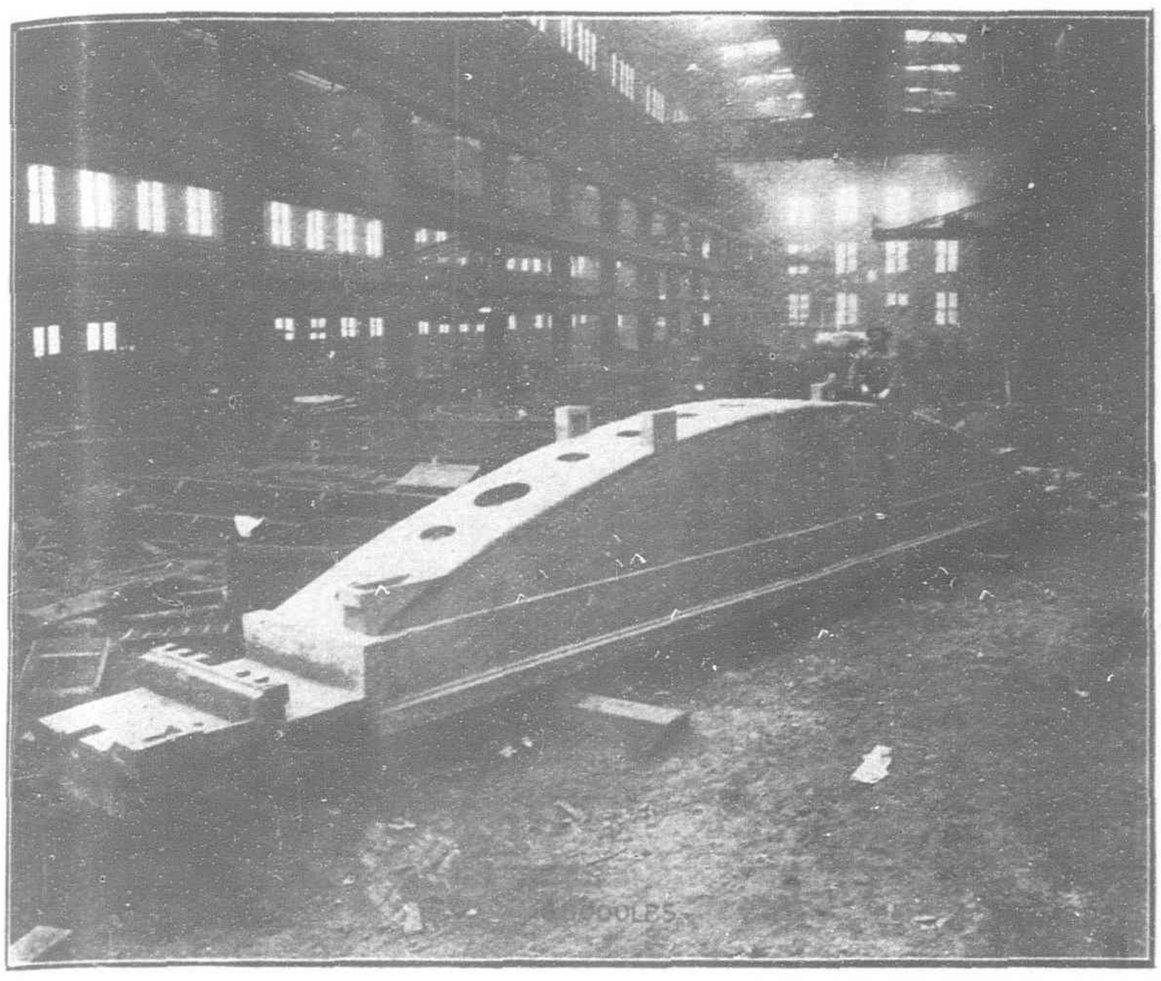
The table is designed to carry a weight of over 200,000 lbs. The extreme size of the table, 34′ diameter, made it necessary to cast in three parts, the central and one side section being shown in accompanying illustrations, Figs. 402 and 405. The three sections of the table weighed 225,000 lbs. The table is supported on conical rollers running in a circular track 24′ in diameter, sunk in the bed. Rollers are of high carbon steel and fitted to circular guide frames to insure alignment of the rollers. In addition, the table rests in an annular adjustable bearing ring surrounding the central spindle. The bearing ring is adjusted vertically by steel screws. The spindle is centered in the bed by an adjustable conical bush.

Table tracks and spindle have forced lubrication from a pump operated from the main driving motor.

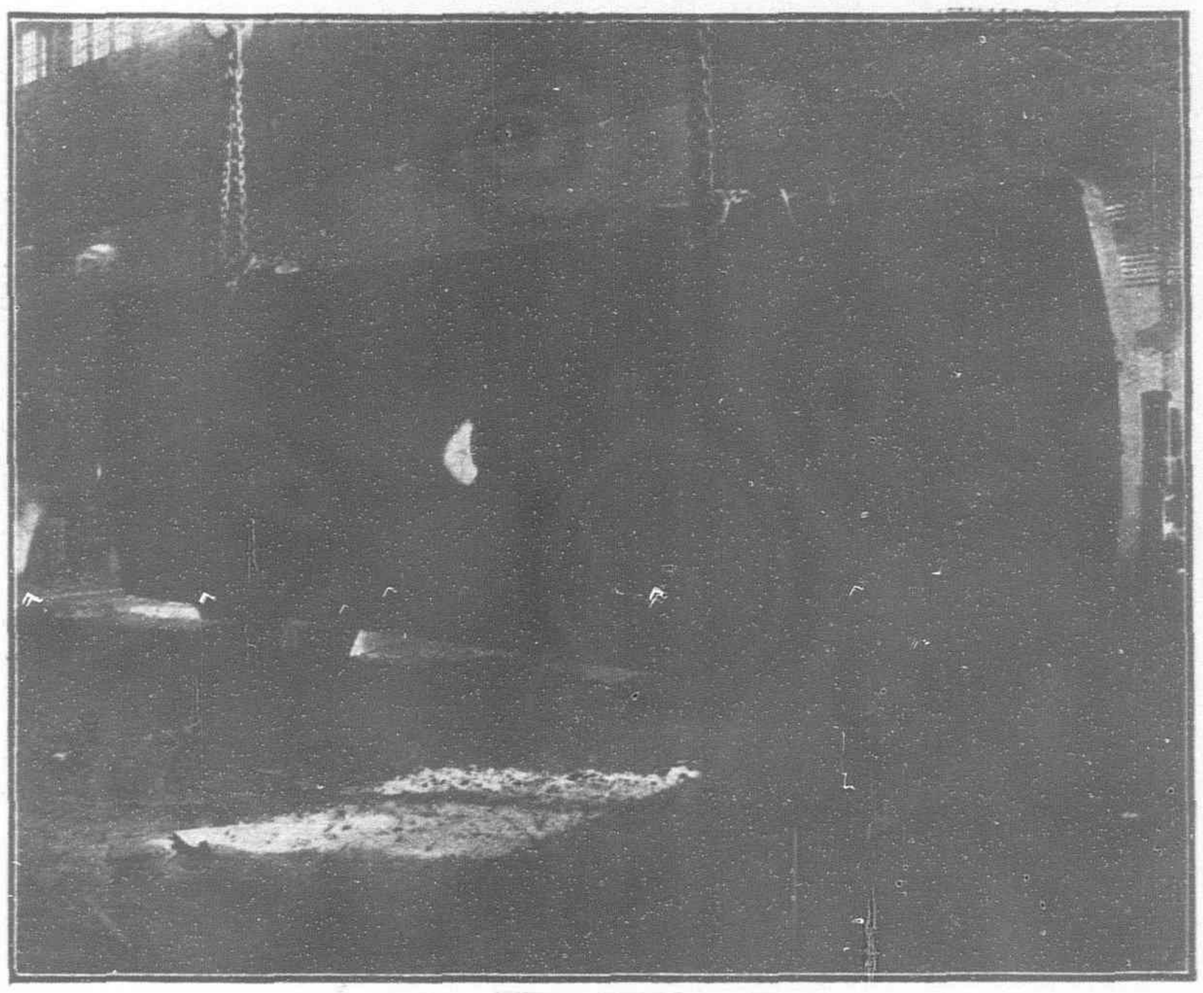
The table is fitted with a spur gear 28′ diam. which is a semi-steel casting, with teeth cut from the solid. It is driven by means of two forged steel pinions, placed on opposite sides of the Mill.



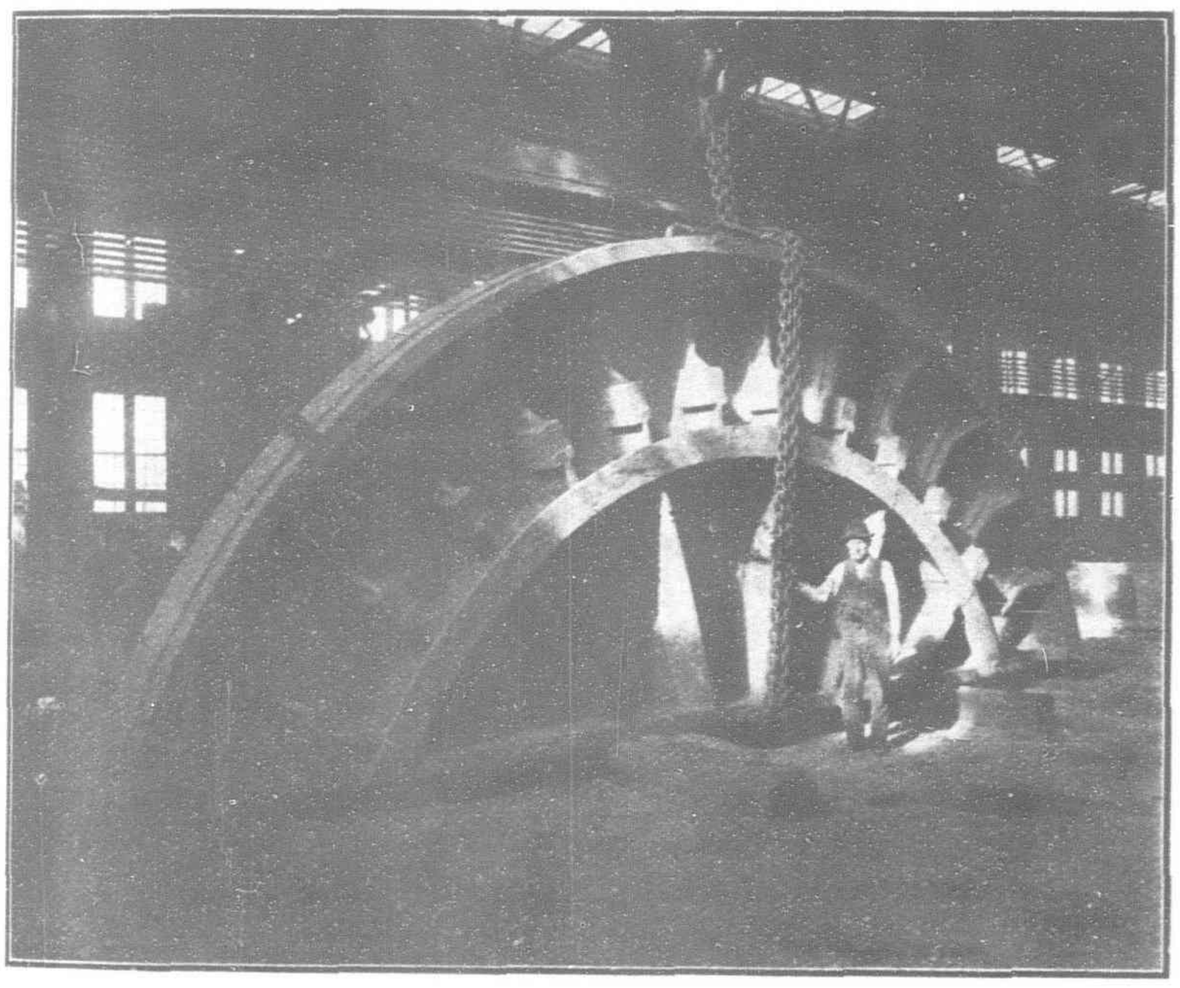
One of the Housings.—Figure 407.



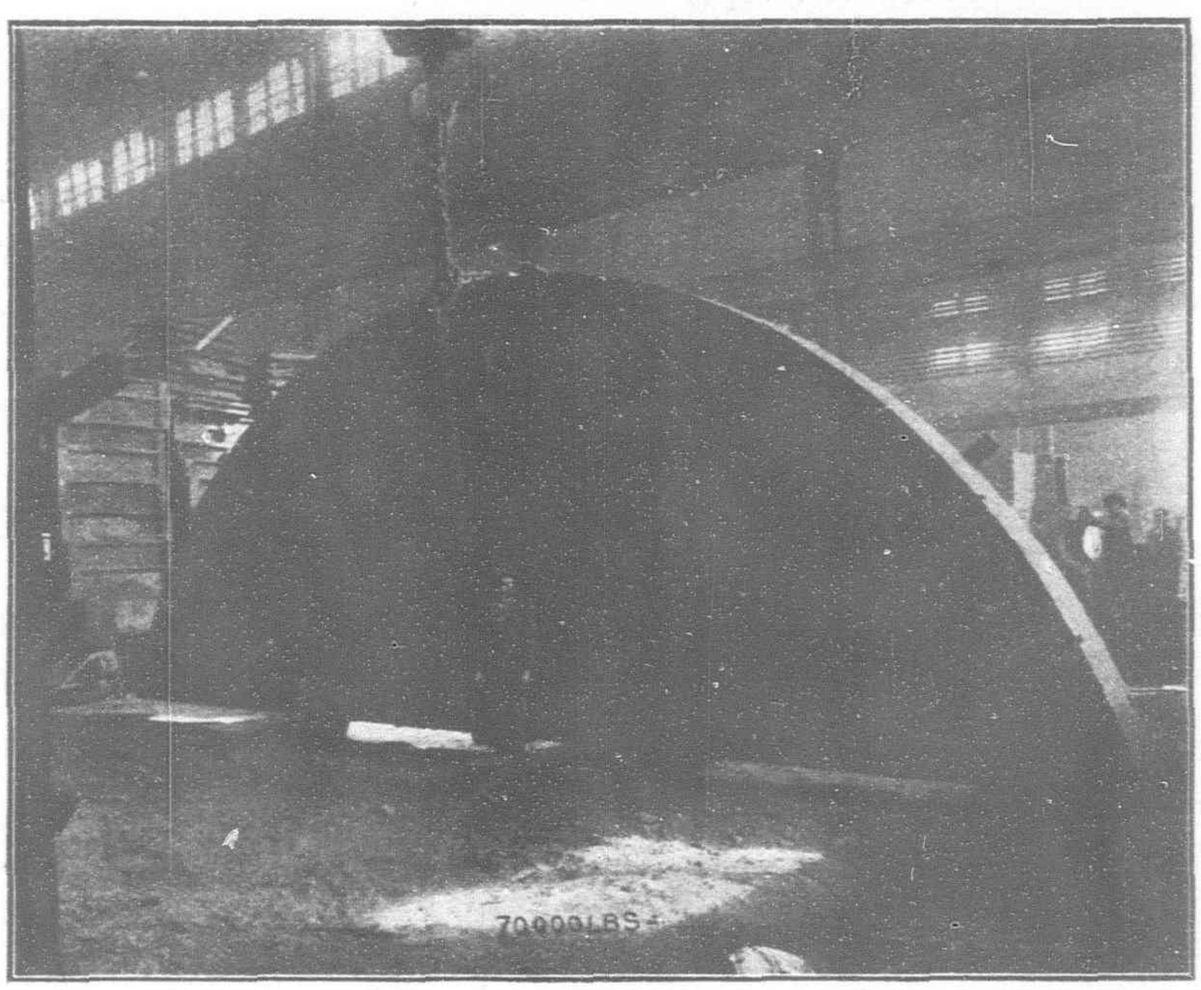
The Cross Rail.—Figure 400.



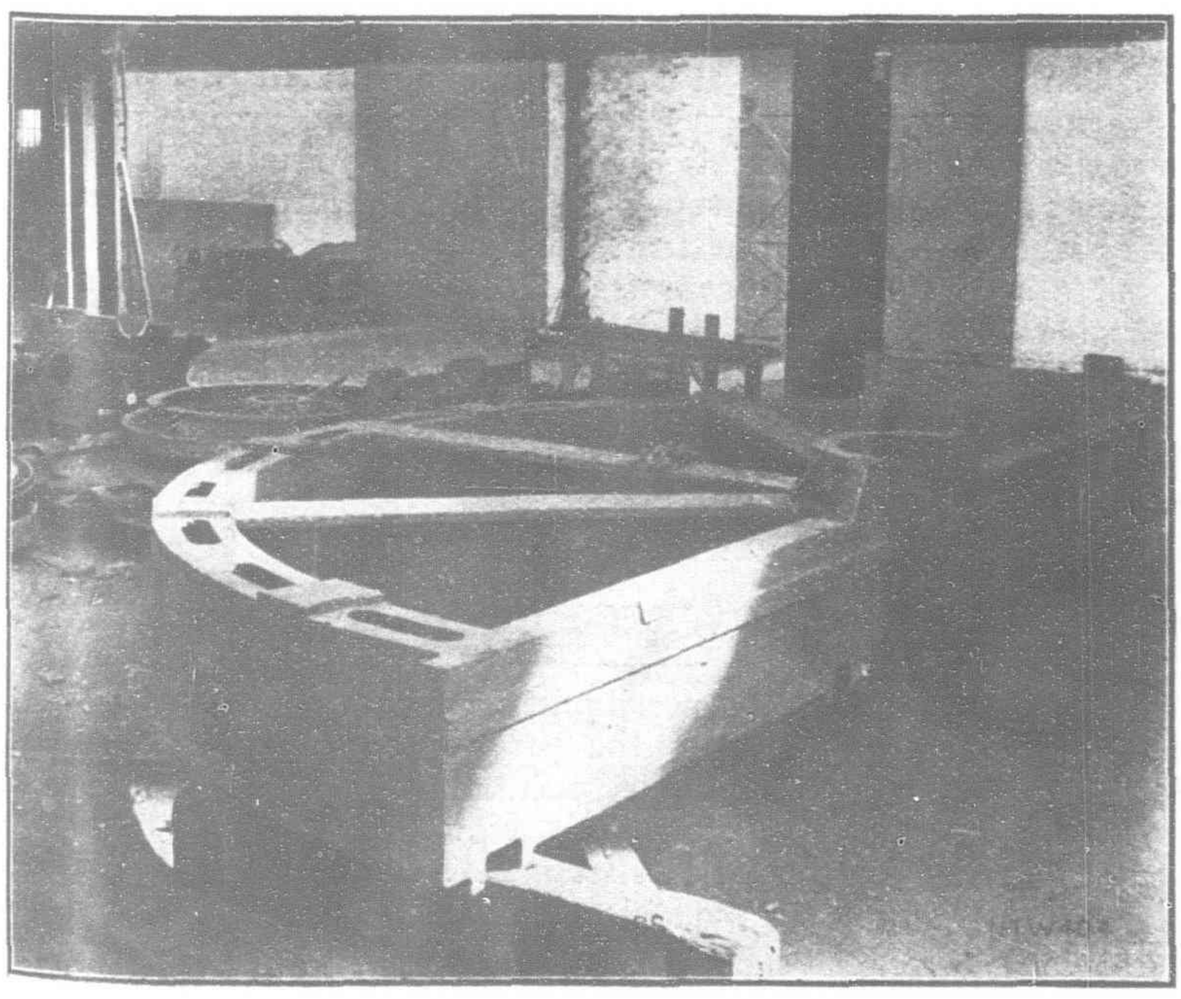
Central Section—Figure 402.



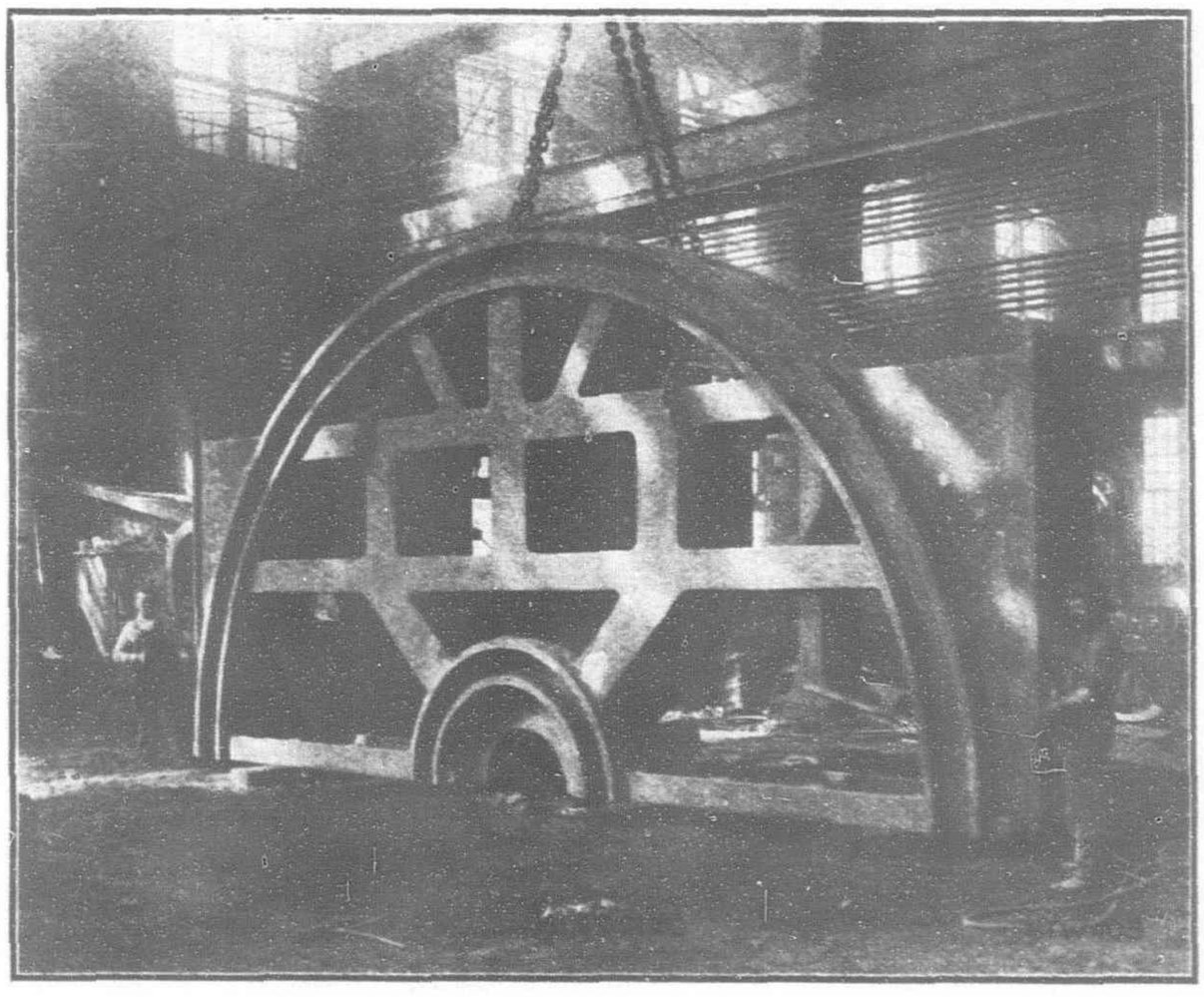
Side Section—Figure4 06.



Side Section—Figure 405.



The Bed—Figure 404.



The Bed—Figure 403.

The main part of the bed is made in two sections shown in Figs. 403 and 404. There are two bed extensions attached to the main bed. The whole bed weighed 69,000 lbs. in the rough and the other section 48,600 lbs. The table tracks are rigidiy supported by the vertical webs of the bed.

The housings, as shown in Fig. 407, are box castings of massive construction, connected at the top by a heavy cross brace. Rigidity is further increased by a steel girder connecting the housings. Each housing weighed in the rough 32,000 lbs.

The cross-rail, as shown in Fig. 400, is about 46 ft. long and weighed 85,000 lbs. in the rough. It is a box casting. Bolted to the top of the cross-rail is a massive camber beam. Its function is to stiffen the cross-rail and take up the sag due to the great weight of the cross-rail and the heads. The combined depth of the cross-rail and the camber is 8'.

The rail is raised and lowered by means of a 30 HP motor located on the top cross brace and connected to four elevating screws of large diameter working in bronze nuts.

The cross-rail is fitted with two heads for boring and turning. The heads are right and left, so arranged that either can be moved to the center. They are provided with graduated swivels, with worm gearing for setting them over to any angle on either side of the vertical of 30 degrees or less.

The heads and bars are provided with rapid power traverse, as well as hand movement for close adjustment. The rapid traverse is operated by a 10 HP motor located on the top brace. The control of these operations and also the engaging and disengaging of feeds is from a platform attached to each head, upon which the operator stands. The operating levers are interlocking so that the rapid traverse cannot be engaged for one head unless it is disengaged from the other, making it impossible for the operator on one head accidentally to move the opposite one.

Eight reversible power feeds are provided for the bars and are operative in a vertical or angular direction. The feeds for each head are entirely independent and positive. Means are provided by friction clutches to prevent the breakage of feed gearing, should either bar or saddle encounter obstruction.

The main drive is by a 75 HP motor, and speeds are provided for boring, turning and facing operations.

PUBLIC WORKS IN MANILA

A committee has been appointed by Governor-General Harrison to render a report on a scheme for the development of the water-front property known as Manila reclamation area No. 1, embracing the sites now occupied by the government piers, with the end of making it the commercial district of the city, and the construction of two bridges or tunnels traversing the Pasig, one near plaza Moraga, largely for the use of Escolta and general retail section traffic, and the second at a point further down stream for the purpose of opening up and assisting the early development of the reclamation area. The committee consists of Secretary Clinton L. Riggs of the department of commerce and police, Commissioner Rafael Palma, Dr. Apacible, chairman of the assembly committee on public works, Alcalde Felix M. Roxas, Assistant Director Walter E. Jones of the bureau of lands, J. S. Stanley, deputy collector of customs, and Willard L. Gorton, chief designing engineer of the bureau of public works.

The powers conferred upon the committee by the chief executive are the fullest, the official order authorizing that body to study and report upon "the development of property of the insular government known as Manila reclamation area No. 1 for the purpose of making it the commercial district of the city of Manila and securing therefrom an adequate return to the government, and the construction of a new bridge across the Pasig River, the north span of which shall be at a point opposite or near that part of plaza Moraga fronting the river, and the south span at a point on the other side of the river directly opposite the north span."

Further details of the projects now under consideration are included in the instructions to the committee, which point out the particular phases of the projects to be given special study.

"In connection with the development of the reclamation area," the order continues, "the committee is authorized to investigate and make recommendations especially as to the desirability and practicability of erecting one or more additional piers for transoceanic shipping, of building a sea wall between the piers so as to make it possible for interisland boats to moor by the sea wall and discharge their cargoes, and of constructing a shed along the water front connecting all of the piers. It is also authorized to examine into and present recommendations as to the means of obtaining from property now belonging to the insular government in the city of Manila funds with which to defray the expense of the development of the said reclamation area. Finally, the committee is authorized to consider the construction of a bridge at a point lower down on the Pasig River calculated to open up and assist in the early development of that area.

"In connection with the construction of a new bridge near plaza Moraga, as well as with the proposed lower Pasig River bridge, the committee is requested to look into the convenience and practicability of a tunnel being substituted for a bridge at either of the places indicated. The committee shall also ascertain if possible the difference between the cost of construction of a bridge and that of a tunnel."

THE TEA TRADE IN CHINA

Granted external and internal peace there is no reason why China should not make marked progress in the next few years. More attention must, however, be given to the question of exports. A strong effort is necessary if the tea trade is ever to regain the ground it has steadily been losing for years past. In 1913 the export of tea to foreign countries fell to 1,442,109 piculs, the lowest figure since 1906. More than half of this was taken by Russia, but Ceylon and Indian teas are reported to be gaining ground rapidly in Russia and there is a grave danger of China losing the one great market that remains to her. Comparing the exportations of tea to Great Britain, Germany, France, Austria-Hungary and America in 1912 and 1913 it is found that in each case there was a very marked falling off. It is evident, therefore, that better methods of culture and preparation must be adopted. This is a task that has its obvious difficulties in a country such as China. The necessity for improvement was recognised long ago by the small fraction of China's population that devotes to problems such as this the attention that they deserve. But the obstacle is now, and always has been, the very people who stand to gain enormously if the great staples of China's export trade are to be permanently popularised with the foreign consumer. Naturally it is difficult to persuade men to change methods that have the sanction of centuries behind them, but it must be done.

This is perhaps a matter more for the Provincial than the Central authorities, although the support of the Central Government would be necessary if any real and lasting reform is to be effected. Officials who have made a study of foreign methods and foreign requirements should be sent on a campaign of education through the tea-growing districts and wherever possible actual object-lessons should be given. It might also be desirable to secure the services of competent experts from India or Ceylon. The accomplishment of tangible results will take time, but eventually a perception on the part of the tea-growers that reforms will mean an increased financial return must lead to their adoption.

OWEN BROS.

We learn that the partnership between Mr. Harold M. Rudd and Mr. Alfred E. Owen, the proprietors of the well and favorably known bituminous solution for iron protection, "Rosphaltic," has been dissolved. For the future the business will be carried on by Mr. Alfred E. Owen and his brother Charles E. Owen under the style and title of Owen Bros.

CHINESE BONDS IN EUROPE

COMPLICATIONS OCCASIONED BY THE WAR

A point affecting holders of interbourse bonds and some of the Chinese issues in particular has arisen out of the cessation of all transactions between London and Berlin. The matter concerns the payment of coupons where both London and German banks act as the agents for the same loan. There are many cases where an issue of bonds has been made in London and other centres simultaneously, where the same bonds are good delivery in more than one country and where the coupons can be cashed in London and one or more other financial centres. Some of the Chinese bonds come within this category, and bonds which were originally issued in Germany are now in British hands, but the holders of the latter are now faced with the difficulty of cashing their coupons in London.

Two Chinese loans at present are affected as regards the payment of coupons on bonds originally issued in Germany. These are the Four and a Half per cent. Gold loan of 1898 for £16,000,000, of which £8,000,000 was issued in London by the Hongkong and Shanghai Bank and £8,000,000 in Germany by the Deutsch-Asiatic Bank, and the Five per cent. Gold loan of 1896 for £16,000,000, which was also equally divided between England and Germany. The money for the payment of the coupons on these is handed over by the Chinese Government in equal proportions to the representatives of the two Banks in China in monthly instalments. The next coupon on the 1898 loan falls due on 1st September and that on the 1896 loan on 1st October, and the monthly instalments for these coupons have already been forwarded by the Banks' representatives in China, so that one half of the money has gone to Berlin and one half has come to London. In the ordinary way the two Banks will cash the coupons of either the London or Berlin issue and settle up with each other at the end of the operation, according to which has paid the larger amount. Now that it is impossible for transactions between Berlin and London to be carried out, however, there is no means of the two Banks making a settlement with one another regarding the balance of coupon money, and no forecast can be made as to when the old status can be resumed. In these circumstances, the Hongkong and Shanghai Bank will pay the coupons on the English issue for which its half share of the monthly instalments paid by China is strictly intended, but it will not pay the German bond coupons, the money for which is in Berlin.

The query has been put as to how the Hongkong and Shanghai Bank can distinguish the different bonds. The answer to this is that there are some differences in the matter of signatures on the bonds, but the principal guide is afforded by the numbers. Below we give the numbers of the bonds of the English issues and the German issues of the 1898 and the 1896 loans, so that holders will be able to tell whether their coupons will be paid by the Hongkong and Shanghai Bank or not:—

CHINESE 4½ PER CENT. GOLD LOAN OF 1898

Nos. of Bonds of the English Issue.

£25	Bonds	A 1 to 1500	inclusive.
£50	,, ...	B 1 to 1500	,,
£100	,, ...	C 1 to 66875	,,
£500	,, ...	D 1 to 2400	,,

Nos. of Bonds of the German Issue.

£25	Bonds	A 1501 to 30000	inclusive.
£50	,, ...	B 1501 to 60000	,,
£100	,, ...	C 66876 to 110000	,,
£500	,, ...	D 2401 to 2500	,,

CHINESE FIVE PER CENT. GOLD LOAN OF 1896.

Nos. of Bonds of the English Issue.

£25	Bonds	A 1 to 6260 & 25061 to 28800	inclusive.
£50	,, ...	B 1 to 12500 & 50001 to 57500	,,
£100	,, ...	C 1 to 37500 & 62501 to 85000	,,
£500	,, ...	D 1 to 937 & 1248 to 1810	,,

Nos. of Bonds of the German Issue.

£25	Bonds	A 6261 to 25060 & 28801 to 40000	,,
£50	,, ...	B 12501 to 50000 & 57501 to 80600	,,
£100	,, ...	C 37501 to 62500 & 85001 to 100000	,,
£50	,, ...	D 938 to 1247 & 1811 to 2000	,,

Efforts are being made whereby some arrangement may be made so that the holders in this country of German issue bonds may receive their coupon money on the above two loans and other issues the interest on which will fall due at later dates. As the money is originally handed over in China, it would seem that the difficulties, although no doubt great, are not insuperable, but the particulars we have given set out the position as it stands at present.

Another bond issue which is affected in the same way as the Chinese loans mentioned is the Royal Siamese Government Four and a Half per cent. Sterling loan of 1907. This loan was issued in London, Paris and Berlin, and the coupons are payable on 1st March and 1st September. The numbers of the bonds of the German issue are as follows:—

£100 bonds... ... ... Nos. 11,251 to 15,000 inclusive.
£20 bonds... ... ... Nos. 71,251 to 90,000 inclusive.

The coupons of the bonds of these German issues will not be paid in London at present at least, but the coupons on bonds of other numbers, whether of the English or French issue, will be cashed here as usual.—*Financial News.*

CHINESE BUSINESS METHODS

The returns of the gross trade of Shanghai in 1913 show an increase of no less than 43,747,057 Haikuan taels, or £5,842,337, over 1912. The revenue collected by the Customs shows an increase over 1912 of nearly £450,000, while it exceeds the previous record in 1906 by over £225,000. At the same time, the share of revenue claimed by each flag has undergone little change. Re-exports have increased by £2,654,731, and the net trade returns show an increase of £3,187,606. No satisfactory explanation (remarks Sir E. Fraser, the British Consul-General) has been offered of this phenomenal advance in trade return figures in a year which appears to have been stigmatised on most sides as bad for business, and in which external conditions invite the same conclusion. The hopes inspired by the good spring trade induced merchants to lay down large stocks of hardware and machinery in the expectation of continued prosperity, with the result that these were considerably larger than normal at the close of the year. 1913 was a particularly lean year as regards contracts for machinery, although the introduction of electric lighting into this part of China made some further progress, and several installations, mostly of German origin, were imported for erection in the neighbourhood.

The Chinese nowadays are constantly endeavouring to obtain machinery on extended terms of payment, and offer only the flimsiest security. They appear to be of opinion that suppliers of machinery should be ready and willing not only to supply machinery at net cash prices on extended terms of payment, but, in addition, to provide the working capital for the industrial undertaking they may have in view. In addition to this, they ask for heavy commissions for the privilege of allowing the foreigner to place them in funds. Such conditions are not reasonable, and although a few such contracts are undertaken by speculative firms, the representatives of British manufacturers as a rule are adverse to business on these lines. A considerable number of orders for railway material have been secured by British manufacturers, but it is to be noticed that the American competition for freight cars is an increasing one.

NEW POST OFFICE BUILDING AT MANILA

The Government of the Philippine Islands proposes to erect in the near future a new post-office building to cost $375,000. The building will be located near the Botanical Gardens overlooking Bagumbayan drive. It will be constructed of reinforced concrete and conform to the Burnham plans for beautifying the city. The post-office work room or mailing department will be 100 by 200 feet. The plan for the new structure, drawn by City Engineer Robinson, has been approved by Governor General Harrison and Secretary Riggs. The money for the new building will be made available out of the funds of the Postal Savings Bank. At present these funds amount to $1,450,000, of which about $400,000 is invested in real-estate loans. Of the balance not needed for current business, $650,000 is invested in the bonds of the city of Manila, Manila Railroad and the Philippine Railway, and $390,000 is deposited with the local banks, drawing 3½ per cent. interest. It is proposed to make the necessary funds available from these surpluses.

SHANGHAI MUNICIPAL COUNCIL BUILDINGS

The Shanghai Municipal Council has accepted the tender of Mr. Yue Chang-tai for building the new Municipal Central offices in artificial stone for the sum of Tls. 599,850. The Council, however, reserves the right to substitute granite for artificial stone as a facing for the building at any time within six months from October 16, 1914 at a price to be agreed upon between the Council and the contractor.

Following are the tenders received:—

	A. Granite	B. Artificial Stone
Wong Kor Sung	Tls. 1,050,000	Tls. 880,000
Sing Tai	995,000	860,000
S. Quai Ling	989,400	882,500
Lee Hop Shun...	987,000	855,000
Yao Sing Kee	973,890	862,315
Hong Mow Kee	936,500	796,500
Chung Yeh Zung	928,500	788,300
Joe Ming Kee	909,500	769,500
Yue Chang Tai	879,500	599,850
Kaung Yue Kee	869,500	689,500
Sin Jin Kee	839,500	699,500

TOBACCO IN CHINA

In his report on the trade of Chefoo for the year 1913 Mr. Consul Willis says, with regard to imports of tobacco, that the contest between the British-American Tobacco Co.'s cheap products and the Japanese manufacturers is as keen as ever. The experiment of the British American Co. in growing tobacco in the neighbourhood of Wei-Hai-Wei, which was commenced about five years ago, is apparently proving a success. The native farmers are being encouraged by the company to grow tobacco, and it is interesting to note that the Chinese there hold their own against modern methods of culture.

ENGINEERING, FINANCIAL AND INDUSTRIAL NEWS

RAILWAYS

Kowloon-Canton Railway.—In presenting the Supply Bill, 1914, to the Hongkong Legislative Council the Governor said in reference to the Kowloon-Canton Railway:—The Estimate of Revenue and Expenditure for 1915 is as follows—Earnings $435,000 and working expenses $323,455, leaving a balance of $112,145 net profit. Compared with the estimate for the current year this shows an increase of $10,754. The experiment of running night trains has been tried during this year, but has not proved successful. The deficit to be made up from General Revenue is $458,510 as against $469,264 last year. The following are the principal items of increase:—"Repairs of Station Buildings, etc.," $2,920. An Assistant Locomotive Superintendent, $3,397. This is a new post, approved by the Secretary of State, which has been rendered necessary by the increase in the number of locomotives. Coal shows an increase of $18,800 due to the rise in price. Oil, tallow and other stores are estimated to cost $3,100 more than last year. This estimate is based on the actual expenditure of 1913 and the revised estimate for the current year. "Materials, maintenance and renewals of Locomotive Engines" is increased by $8,348 to provide for increased repairs next year, as it has been impossible to spare the engines during the current year for this purpose. Three new locomotives will be available next year, and the old ones will then have a thorough overhaul. Under "Repairs and renewals of coaching vehicles" the items wages, power and materials have been increased by $2,265, $1,238 and $2,740 respectively. A new printing machine at a cost of $3,000 has been provided for and a sum of $1,000 is provided for hire of 1st and 2nd class coaches from the Chinese Section for week-end traffic. The arrival of the new rolling stock will obviate this expenditure in future. A post of "Inspector of Station Accounts" has been created at a salary of $2,400. A sum of $2,500 has been entered for house allowances pending the erection of quarters for the European Subordinate Officers. It is proposed to build quarters next year, which will be occupied free of rent.

Hu-Hang-Yung Line.—Mr. M. Y. Chung, Managing Director of the Shanghai-Hangchow-Ningpo or Hu-Hang-Yung Railway announces the following appointments of Heads of Departments of the said Railway with effect from October 23, 1914, in conjunction with their respective co-ordinate appointments in the Shanghai-Nanking Railway service:—

Mr. A. C. Clear, M. Inst. C.E., as Engineer-in-Chief.
" H. Middleton as Chief Accountant.
" J. D. Read as Acting Traffic Manager.
" E. J. Dunstan, M.I.Mech.E., as Locomotive Superintendent.

Kaifeng-Hsuchowfu Line.—A correspondent wrote from Suichow on September 25:—Apropos of several comments seen from time to time as to whether the construction work on the Kaifeng-Hsuchowfu railroad was at a standstill, the following information may be of interest. I recently passed through Kueiteh and had a talk with M. Bernhard, in charge of the district. The engineers who had been withdrawn for the war were being replaced and work was progressing, he said. Asked as to what effect the recent rains would have on the work he said the Hsuchow end was affected as some twenty *li* of grading was under water. Going down the river to Shanghai recently I had a talk with a Belgian from Chengchow, who informed me that the steel for this section is now in Hankow. We may not be able to use the road this year as was formerly reported, but, as M. Bernhard remarked, contracts must be met and they apparently call for an early completion of the work.

Swatow-Chaochowfu Railway.—Passenger receipts for 1913 are reported to have increased about 20 per cent. over 1912, but freight receipts continued to be insignificant. There were no improvements to the line nor any additions made to the rolling stock. Reports have been current that the line is to be extended, but not during 1914.

Shanghai-Nanking Railway.—The following figures of traffic returns (approximately) for the week ended September 19, are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	48,806	8,798	57,604
1913....	47,991	9,046	57,037
Increase.	815	—	567
Decrease	—	248	—

For 12 weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	513,500	124,360	637,860
1913....	436,070	88,456	524,526
Increase.	77,430	35,904	113,334
Decrease	—	—	—

Week ended September 26.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	42,298	8,277	50,575
1913....	55,257	10,838	66,095
Increase.	—	—	—
Decrease	12,959	2,561	15,520

For 13 weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914	555,798	132,637	688,435
1913	491,327	99,294	590,621
Increase.	64,471	33,343	97,814
Decrease	—	—	—

Week ended October 3

Year.	Passengers.	Goods & Sundries	Total for the week.
	$	$	$
1914	51,242	9,248	60,490
1913	55,911	9,132	65,043
Increase.	—	—	—
Decrease	4,669	116	4,553

For 14 weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	607,049	141,885	748,925
1913....	547,238	108,426	655,664
Increase.	59,802	33,459	93,261
Decrease	—	—	—

Week ended October 10

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	51,414	9,562	60,976
1913....	58,639	10,798	69,137
Increase.	—	—	—
Decrease	7,225	1,236	8,461

For 15 weeks.

Year.	Passengers.	Goods & Sundries	Total for the week.
	$	$	$
1914....	658,454	151,447	809,901
1913....	605,877	119,224	725,101
Increase.	52,577	32,223	84,800
Decrease	—	—	—

Light Railways Chartered:—Charters have been granted by the Imperial Japanese Railway Board to the Johan Light Railway Company for the laying of a steam light railway with a length of 7.66 miles between Horiye and Matsushima, Itano-gun, Tokushima prefecture, with a capital of 350,000 yen, and to the Oita Light Railway Company for the construction of a steam light railway with a length of 12.20 miles, which will cost 1,600,000 yen, between Sasaguri and Iidzuka, Oita prefecture.

Charters have also been granted for four light railways, as follows: Katori Railway Co., 7-mile line, Omigawa to Saware, cost $165,000; Hokuso Railway Co., 20-mile line, Kinoshita to Urayasu, capital $500,000; Tobim Light Railway Co., 11-mile line, Imbe to Toyomura, cost $190,000; Ushimado Light Railway Co., 8-mile line, from terminus of last-named railway to Ushimado, cost $185,000.

South Manchuria Railway.—The first locomotive of standard gauge to be manufactured by the Japanese has been turned out by the South Manchuria Railway Workshops at Shahokou. The Workshops adopted the superior points in locomotives of English and American manufacture. The locomotive is fitted up with the superheat steam appliances of the most up-to-date pattern, by which means a saving of coal by about 20 per cent. can be attained. The work of construction was taken in hand last February and the first standard locomotive was finished on September 21. Recently a trial traction run was made at Dairen with a train of goods cars. The engine belongs to what is technically known as the Consolidation type, and has larger dimensions by 20 per cent. than the largest of its class in the Company's possession.

Five more of the same type are now in course of construction and will be completed by next February. The whole cost for one locomotive is said to be less than Y40,000 which sum is several thousand yen cheaper than what will be required for one of foreign make.

The Workshops have also taken in hand six locomotives ordered by the Chosen Railway Administration. They are to be built on a special design befitting them for service over the Seoul-Wonsan line which, in its major part, has a gradient of 1/40.

New Railway Station.—Plans are being made for new station buildings for the Siamese Southern Railway at Bangkok Noi. This is to provide for the increased traffic

which is expected on completion of the extension of this railway, the length of which when completed will be about 813 miles. The line is now open to traffic from Petchaburi to Prang, about 147 miles.

It is expected that the line as far as Singora will be opened for traffic in 1916. The construction of this line was started in 1909 at three places, namely, Petchaburi, Singora, and Prang, and at that time it was hoped that the whole line would be ready for traffic in 1915.

Siamese Railway Orders.—At the offices of the Royal Siamese State Railways, Southern Line, tenders were opened for the supply of 11,200 metric tons of steel rails and 50,000 pairs of fishplates, 150,000 bearing plates, 290,000 bolts and nuts, 200,000 spring washers, and 1,450,000 rail spikes. There were 4 tenderers for steel rail and 18 for the permanent-way accessories.

The tender of Schleif Trinks & Co. (Ltd.), representing the Carnegie Steel Works of America, was accepted for 11,200 tons of rails. The price, c. i. f. Singora, was £7 4s 6d. ($35.16) per ton, or a total of £80,920 ($393,797). The Bangkok agents of the successful tenderers were Louis T. Leonowens (Ltd.).

For permanent-way accessories the tender accepted was that of the Societe Anonyme Laminoirs et Boulonneries du Ruan, Monceau sur Sambre, Belgium. The total price, f. o. b. Antwerp, was £9,863 3s ($47,999).

The bridge over the River Mee Yom having been finished, another section of the Northern Railway from Pak Ta to Ban Pin was opened for traffic on June 15, 1914.

The Kedah Railway.—The following is from the annual report on Kedah for the year ended November 30, 1913:—The Railway Administration, which had started work upon the Bukit Mertajam-Alor Star line in October of the preceding year, obtained complete possession of the land required for the line on February 1, it is reported. Work has been carried out with great energy throughout the year. Construction trains are running for a distance of fifteen miles at the southern end and ten miles at the northern end. It is expected that the entire section, which is 56 miles long, will be open for traffic in 1915. The much hoped for extension of the line from Alor Star to Perlis and thence to the Singora frontier was decided upon at the end of the year under review. The line will connect with the railway system of Southern Siam at the Singora frontier, and will thus form the link that will join up the Siamese Royal Railways with the Federated Malay States Railways, and afford through railway communication between Bangkok and Penang. In addition to bringing Bangkok many days nearer to Europe for passengers and mails, this railway will "be the making of" Kedah and Perlis, and will, it is hoped, be of the greatest benefit to the development of the Siamese provinces to the north of Kedah.

The Manila Railroad Co.—This Co. has just opened a new branch line between the municipalities of Santa Ana and Arayat, in the Province of Pampanga. The railway runs through a rich agricultural district devoted largely to sugar cane. Heretofore the crops of the region have been transported to market with great difficulty and expense. The new line should greatly enhance the wealth of the Province, as increased production always follows better facilities for marketing in such regions of the Philippines.

Tram Lines.—Serious plans are on foot for laying tram lines in eastern Java by the State railways, as, for instance, a line from Phoreton to Besoeki. State railway officials are busily engaged in surveying work. It is said to be the intention to extend the Pandji line and run a tram across the Genteng district (Banjoewangi). A tram line connecting with a few coffee estates is also under consideration.

British North Borneo Railway.—At the half yearly meeting of the British North Borneo Company held in London on July 14 the Chairman said in the course of his speech:—With regard to the railway, steady progress continues to be made. The increase in the receipts is very satisfactory, seeing that it maintains the average increase shown in the last five years. Between 1909 and 1913 the receipts increased by £13,653, which is equal to an average annual increase of £3,413. In other words, the railway receipts have increased in four years by 125 per cent. On the other hand, the railway expenditure increased between 1909 and 1913 by £11,675, or an increase in the four years of 74 per cent. The increase of £5,500 in the expenditure of 1913 over the expenditure of 1912 is mainly due to the fact that the number of locomotives, carriages, and wagons has been considerably increased, and also owing to the fact that a much more efficient and punctual service of trains has been maintained. Both receipts and expenditure have been adversely affected by the damage by floods to the bridge over the Papar River, this bridge having been twice during the year partially washed away. Given a reasonable immunity from such accidents in the future, we have no doubt that the results will be much more satisfactory. The reconstruction work being carried out will effect, when completed, a considerable decrease in working expenditure, and should bring it at least down to equality with the receipts, and it is hoped that the latter may even show a balance. The relaying of the main line will be a great improvement and should conduce to more economical working of the line in future, added to which the wear and tear on rolling stock and on the track itself should be appreciably less. The reconstruction is progressing very satisfactorily under the able supervision of the general manager, Mr. Watson. It has been a costly business, but, as I have repeatedly told you, this reconstruction was absolutely necessary, for the line—which was originally a pioneer line—was literally crumbling to pieces and unless a large expenditure was incurred the bridges especially—which were of a temporary nature—would have fallen to pieces, and such of the line as remained would have been practically useless. Up to the end of 1913 we have expended about £167,000 in reconstruction, and it is estimated that a further expenditure of about £40,000 will probably be necessary. The policy of constructing the railway in the first instance has been questioned, but you will remember that if it had not been for the existence of the railway we could not have induced rubber companies to expend £2,000,000 and £3,000,000 in the development of the country. But whatever views may be held on this question, I do not think any one would advise the abandonment of the line.

Moreover, we see every prospect of its proving remunerative in the future, and with this view we are about to undertake its extension for about 20 miles from Jesselton in a northern direction to Tuaran. The Governor and Mr. Watson, the railway manager, have very strongly recommended this extension. They point out that the line will pass through a comparatively rich part of the country, where there is a large native population, who would naturally use the line for transporting their produce to the coast. They further point out that the extension should prove immediately remunerative, as a considerable passenger and goods traffic may be expected from the outset, and that it will materially benefit the port and town of Jesselton. Tuaran is an important rice-growing district, but at present the difficulties and expense of transport are so great that it does not pay the native cultivators to grow more rice than is sufficient for their own needs. The extension of the line to Tuaran will pave the way for further extension in the not very remote future through the Tempasuk district to Kota Belud, and possibly on to Maruda Bay. The Court have accordingly authorized the Governor to take the first steps towards the commencement of this important work. The Governor estimates the cost at roughly speaking, £62,000, which works out at a little over £3,000 per mile—a very moderate outlay; but against this must be placed the £25,000 the cost of the road which I stated last year would be constructed and which, of course, would have yielded no direct revenue. I may take this opportunity of stating that in Mr. Watson we have a general manager of the highest standing. From the outset we have had every reason to be satisfied with his work, which meets with nothing but praise from all sides.

South Siberian Railroad Concession.—The Second Department of the Russian Government Council has expressed itself in favor of granting the concession for the South Siberian Railroad to private capital because it is considered doubtful whether the Government would undertake the work. It has been proposed to give the concession to a company backed by British capital. The conditions are not yet decided.

Experiments with All-steel Cars in India.—All steel cars are being experimented with on several railway lines in India. Other lines probably will undertake experiments or await the results of the experiments of lines that now have the matter under consideration.

Metal freight cars have long been in use in India, but passenger cars are usually built of teakwood resting on steel underframes. Owing to the intense heat there, and in some cases the great changes in temperature through which cars pass, the wood warps, swells, or shrinks, and joints are affected. This causes a certain swaying of the body and throws doors and windows out of plumb, causing more or less jambing. The element of danger to life is also being considered.

The wood of which the cars are made has been cheap in India but with the rise in the price of teak and the cheapening of steel the of use the latter has become possible.

Kasara Railway Tunnel near Bombay.—A railway tunnel 1,507 feet in length is now being constructed for the Great Indian Peninsular Railway in the Western Ghats about 100 miles from Bombay. The contractors are Pauling & Co., Outram Road, Bombay, who began work on the tunnel by machine drills on December 6, 1913. To expedite the work two shafts, one of 101 feet and the other of 89 feet, were sunk. The headings met in July 8 of this year, construction having progressed at the rate of 215 feet per month. It is expected that the work will be completed in July, 1915. The tunnel is being worked out on the Belgian system—by opening out the top section first, inserting the arching where necessary, and taking the lower part out subsequent to formation. The tunnel will render unnecessary a reversing station now required on account of heavy grades.

ELECTRIC LIGHT AND TRACTION

Vigan Waterworks and Electric Light Plant.—Construction has been started in the municipality of Vigan, in Ilocos Sur, on a new water system and a new electric lighting plant. The waterworks plant is to be the property of the municipality, which is constructing it, while the electric lighting plant is to be privately owned and represents principally Filipino investments. It is expected that both plants will be opened by December.

Electrical Development in Korea.—An electrical company in New Wiju has recently

commenced operations, while Okura & Company are to extend the service of their plant at Shinanju. The plant now supplies power to the gold mines of the Oriental Consolidated Mining Co., at Unsan. The Korean Government is investigating the prospects of developing hydro electric plants for the application of electric power to industrial establishments.

Japan.—The proposed extension of the Odawara Electric Railway to Hakone hot springs, is being revived, and the directors have decided to start construction within a few months; estimated cost $650,000.

Swatow Electric Light Co.—It is reported that the Swatow Kaiming Electric Light Co. had a successful year. The number of lights was increased by about 1,000 and now totals 9,000 or thereabouts. From the beginning of 1913 the cost of electric current was increased by 25 per cent.

Kongmun Electric Light.—A Hongkong electrical firm has obtained the contract for supplying machinery for an electric-light plant at Kongmun, Kwangtung Province, which will cost about $5,200 gold. The engines are of Swedish manufacture and the other parts are German. The monopoly for furnishing electric current at Kongmun will soon expire, and the new company will take over this monopoly as soon as its plant is ready. The same Hongkong company has already furnished the equipment for plants at San Choung, Sunning district, and also at Sunning City, the former costing about $4,200 gold and the latter $7,250 gold. The cost of erecting a building of the kind required is about $400 gold.

The Chinese company holding the monopoly for Kongmun and the other two companies propose to lay lines to the smaller villages, and in this way increase very considerably the number of users. The cost for a 16-candle-power light per month will be about 40 cents gold and, as is customary, a substantial reduction will be made to establishments using a considerable number of lights.

Hongkong Tramways.—The tenth year of the Hongkong tramway system just closed has been the most successful year in the history of the concern, according to the reports presented the company at its annual meeting. The last year was somewhat better than the previous year not only in actual returns, but in the improvements made in the system and in building up its reserves. The concern now is paying a good return upon the investment and is increasing its value in every way. It is now operated largely upon the American system of fares and general management.

The history of the company is of special significance in the development of such a business in the Far East. Hongkong's topography—a small island composed almost entirely of a range of hills with steep slopes—offers little opportunity for the development of a street-car system. The system was inaugurated in 1904 in the establishment of a short line along the water front designed to serve crowds of people passing between especially thickly settled but rather widely separated Chinese districts and also designed to serve workmen employed at certain of the larger industrial establishments of the port.

The problem to be solved related not only to the ability and success of the company to carry large numbers of people at very low fares consistent with the paying ability of the Chinese workmen expected to patronize the road, but also represented competition with jinrickshas and sedan chairs, such means of transport largely serving the foreign and well-to-do Chinese population but also serving a considerable portion of the middle-class Chinese people. The adjustment of fares to meet this competition and come within the reach of the paying power of the Chinese was a very delicate matter. The first fares established provided for three classes and for zone or sectional fares, namely, 10 cents local currency for first-class fares, 8 cents for second-class fare, and 5 cents for third class fare, all within certain fixed limits, depending upon the length of the ride, the fares to be increased 50 and 100 per cent for additional rides within other fixed limits. There were other and even lower fares for particular classes and within certain zones.

Not only because of the innate difficulty of managing so many varying fares and fare districts but also because of the difficulties growing out of varying values of Chinese and Hongkong silver and copper coinage, it was early perceived that simplification was necessary. The first innovation was a removal of the zone limits and the payment of the single fare for all distances upon the main line of the system. The second was the abolishment of the second-class fare. The service now provides for a 10-cent fare (local currency), equal to about 4.7 cents gold at present exchange, as first-class fare, which represents the service usually taken by Europeans and well-to-do Chinese, and a third-class fare of 5 cents local currency, which represents the service usually taken by the mass of Chinese, Indian, and other Asiatic patrons. This simplification of fares has been of immense advantage to the public and has resulted in or contributed to the result of an immense increase in the use of first-class accommodations.

Until within the past four years the trams were used comparatively little by Europeans, who usually preferred the 'ricksha except for long distances and special trips. For medium distances the 'ricksha and car fare runs about the same; for long distances the cars are cheaper, and for short distances the 'rickshas are cheaper. As a result of the increasing insolence and laziness of 'ricksha men, however, and partly because of the numerous 'ricksha accidents, and also as a result of improved service of the tramways, the latter are becoming quite popular among foreigners. It is curious to note, however, that while the business of the tramways has thus increased materially the number of 'rickshas also has increased, the number licensed in the colony at the present time being something over 1,500 as compared with about 800 six years ago.

Electrical Standardization in China.—There are at present no recognized standards of electrical supply in China. In some instances direct current is supplied; in others, alternating. There are different phases, frequencies, and voltages. The Engineering Society of China, however, is working with a view to the standardization of the supply, to be followed by some practical and effective plan for the standardization of the materials used in this line. A committee appointed to consider the subject has arrived at the following recommendations and decisions, which have been circulated as widely as possible in Europe and America in order to obtain free and valuable discussions and suggestions:

1. That generation and distribution generally shall be on 3-phase system at 50 or 60 cycles per second.

2. That distribution shall be carried out generally on the 4-wire 3-phase system with grounded neutral at a pressure of 250 volts between 1-phase and neutral, i.e., 440 volts (approximately) between phases.

3. That the standard pressure for domestic lighting and similar supply shall be 250 volts.

4. That when it is not desirable or economical to use a 4-wire 3-phase supply, then a 3-wire system with neutral grounded or a 2-wire system with one side grounded shall be adopted; in all cases the pressure to ground shall be 250 volts.

5. That the use of direct-current systems shall be discouraged and they shall not be allowed for systems involving either over 50 kilowatts in capacity or having feeder of over one-half mile in length.

6. That no fuses or switches shall be allowed in the neutral wire.

7. That where direct-current systems are essential the generation and distribution shall be on the 3-wire system at 500 volts between outers, the neutral being grounded.

8. That the following pressures shall be considered as standards for high-tension transmission: 2,200 volts, 3,300 volts, 6,600 volts. Pressures above 6,600 volts to be as required by local and other conditions.

Shanghai Tramways.—The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for the week ended September 23, 1914, with figures for the corresponding week last year:—

	1914. $	1913. $
Gross receipts	24,603.45	25,113.20
Loss by currency depreciation	6,132.64	5,645.10
Effective Receipts	18,470.81	19,468.10
Percentage of loss by currency depreciation	26.71	23.66
Passengers carried	1,070,315	1,051,249
Car miles run	60,185	57,337

Week ended September 30.

	1914. $	1913. $
Gross receipts	25,032.38	25,113.20
Loss by currency depreciation	6,442.66	5,645.10
Effective receipts	18,589.72	19,468.10
Percentage of loss by currency depreciation	27.57	23.66
Passengers carried	1,113.220	1,051,240
Car miles run	50,390	57,337

Week ended October 7.

	1914. $	1913. $
Gross receipts	27,310.72	25,078.20
Loss by currency depreciation	7,238.18	5,859.48
Effective receipts	20,072.54	20,118.72
Percentage of loss by currency depreciation	28.02	23.65
Passengers carried	1,225,950	1,083,399
Car miles run	60,041	58,409

Week ended October 14.

	1914. $	1913. $
Gross receipts	26,153.72	26,330.23
Loss by currency depreciation	6,838.55	5,896,68
Effective receipts	19,315.17	20,461.15
Percentage of loss by currency depreciation	27.82	23.34
Passengers carried	1,163,588	1,069,068
Car miles run	59,672	59,037

SHIPBUILDING AND STEAMSHIPS

Japanese European Liners.—The *Fushimi Maru*, launched at Nagasaki on June 28, 1914, is being built for the Nippon Yusen Kaisha for its European Line from Yokohama to London via the Suez Canal. It will be a steel twin-screw steamer of 11,800 tons gross register, with triple-expansion engines and the contract speed calls for 16¼ knots per hour. The keel was laid in May, 1913, and the vessel is to be ready for sea on November 17, 1914.

New Steamers for Szechuan.—From telegraphic information, the Nicholas Tsu Engineering and Shipbuilding Works of Shanghai learns that the steamer *Chingyu*, which was built for the Juiching Company of Szechuan, and which left Shanghai on September 19, safely arrived at Chungking on October

10. Another light-draft steamer named *Lichuan*, built for the Szechuan Railway Administration, left Shanghai on September 30 and arrived at Ichang on October 14; she was to proceed to Chungking a day or two later.

The Nicholas Tsu Works have built another steamer called the *Yuhang* to ply between Changsha and Hankow. The last boat will shortly be transferred to the run between Ichang and Chungking, when there will be altogether four such light-draft boats built at the Nicholas Tsu Works, trading in Szechuan waters.

Kiangnan Dockyard.—The three icebreakers which have been built by the Kiangnan Dock, Shanghai, have been completed and two of them, the *Marksman* and *Engineer*, left for Vladivostok, proceeding under their own steam. The third vessel, the *Meiling*, which is intended for service in Chinwangtao harbor for the Kailan Mining Administration, will shortly be handed over.

New Steamship Company.—A new Japanese shipping company (South Sea Mail Steamer Co., Ltd.), capital $747,000, will shortly be organized in Tokyo. Its promoters have been carrying on a steamship service between Japan and the South Pacific with $75,000 annual State aid. Complying with the request of the Communications Department, the above company is organized and will shortly inaugurate the service. It is understood that the Diet will be asked to double the subsidy, and that the company will buy new craft.

New Chinese Steamship Co.—This has been organized at Antung by the Chamber of Commerce and leading merchants of the port, under the name of the Kwang Yi Co. Through the Ching Kee Co., of Chefoo, it purchased at 11,000 taels (about $15,200) a Norwegian steamer of 1,990 tons, which is named the *Tong Lee*. An additional 6,000 taels (about $3,900) was expended on repairs made at Dairen after delivery of the steamer. It is the plan of this company to open an Antung-Shanghai service.

New Nippon Yusen Kaisha Liner.—The latest addition to the Nippon Yusen Kaisha fleet is the Suwa Maru, a vessel of 12,000 tons. She is the largest vessel built for the company's European route. The Suwa is equipped with the latest appliances to give facilities and convenience to the passengers. All the cabins are beautifully carpeted, and furnished with every requisite to each berth, chests of drawers, wardrobes with long mirrors in front, etc., each berth being fitted with an electric lamp, in addition to the customary ceiling lamp. Special care has been taken to meet all requirements of tropical climates. Every cabin is equipped with electric fans, and is unusually roomy. A number of the cabins are equipped with two berths placed on a level at either end of the room instead of one over the other as is customary, thus removing the usual inconvenience of selecting "upper or lower berth." A luxurious suite of rooms is on the promenade deck, consisting of a sitting room, a bed room (to be booked together or separately as the case may be) and a bath-room with lavatory, the bed room being provided with Neptune's broad silver cot berth. The sitting room is decorated with beautiful sculpture in wood, and is also furnished with sleeping berths which are, however, so designed that all evidence of their being such is concealed when not in use. All the fittings and furniture in these rooms are of the best artistic design and taste. Ten of the cabins are single berthed and are specially fitted for those desiring privacy. The dimensions of the steamer are as follows: gross tonnage 12,000 tons, length 525 feet, beam 63 feet 5 inches, depth 37 feet 6 inches, displacement 21,000 tons, speed 17 knots, classed 100 A. 1. at Lloyd's. She can accommodate 121 first class passengers, 60 second class passengers and 190 steerage passengers.

The Suwa Maru was built at the Mitsu Bishi yards at Nagasaki.

WATERWORKS

Loan for Extension of Waterworks in Karachi.—The municipality of Karachi, India, has issued notice of a $206,500 20-year loan for extending the city waterworks. The loan has the sanction of the Government of India.

Manufacturers of machinery and tools used in city waterworks and for construction purposes should communicate with Harchandrai Vishindas, Esq., president Karachi Municipality, Karachi, Sind, India.

Bangkok Waterworks.—The final stage in the construction of the Bangkok waterworks has now been reached with installation of the hydrants and street fountains, which have recently arrived from Europe. It was expected that the water will be turned into the mains in September, and when the connecting up with buildings has started there will be a large demand for all sorts of plumbing material, which all must be supplied from abroad, as such material is not manufactured locally.

Hongkong Additional Waterworks.—The problem of providing a sufficient supply of water for the increasing population of Hongkong has been a serious one, and several times there has been almost a water famine, due to the shortness of the rainy season. The Government has been engaged for a few years in devising methods whereby the supply would be ever sufficient to meet all reasonable demands and two years ago a contract was let to construct the Tytam Tuk Reservoir and the necessary pumping equipment.

The main features of the scheme will be the construction of an enormous masonry dam, 160 feet high, to impound 1,500 million gallons of water, the extension of the existing pumping station near the shore of Tytam Bay, and the provision of two sets of pumping machinery each capable of delivering 2 million gallons of water per day of 24 hours. The work will be completed in 1917. The estimated cost of this undertaking is about $1,200,000 gold. When it is completed the water storage and catchment area of the island will embrace an area of over 2,000 acres. There will still be room for a little further extension should the needs of the growing population call for it, but that is scarcely likely to arise for another 30 or 40 years; and in the event of the population of the island growing to such an enormous extent as to render the supply on the island insufficient to meet the requirements, it will always be possible to bring from the other side of the harbor as much water as may be needed.

Artesian Wells.—New artesian wells have been sunk by the Philippines Government, one at Villasis, Pangasinan, 140 feet deep and yielding a flow of 100,800 gallons a day; another at Baliwag, Bulacan, 250 feet deep and giving a flow of 86,400 gallons a day.

Increased Water Supply for Bombay.—It is anticipated that before the end of the year 1915 the city of Bombay will receive 50 million gallons of water every day as against the present daily supply of 30 million gallons; this increase being effected by the duplication of the present Tansa main bringing water to the city. This scheme, which was started about a year ago, is now more than half completed, and it claims a twofold importance, for, in addition to being one of the biggest water-supply projects carried out in India, it marks the first occasion on which huge steel pipes of the "lock-bar" type have been made in India.

Early in 1912 the hydraulic engineer to the Bombay Corporation drew up a report in which he estimated the requirements of the population that would have to be provided for at 51 million gallons per day and showed how the necessary increase could best be provided by constructing another Tansa main, as had long been proposed by the municipality. It was decided to carry out his scheme, and up to the present contracts totaling some Rs. 70 lakhs ($2,240,000) have been let for constructing the main from the headworks of the water supply to Bombay and for raising the dam at Tansa. The work of laying the new main has been simplified, owing to provision having been made in the bridges, culverts, syphon heads, and embankment at the time of construction of the works in 1890 for a second main, so that the actual pipe laying has become a comparatively straightforward task. Last year the scheme was set in motion, the first work taken in hand being widening the embankments and the preparation of the bed for the new main. The contract for raising the dam was let to Messrs. Pallonji Edalji & Son, of Bombay, for $110,000. The work included the building of nearly 1½ million cubic feet of masonry on top of the existing dam. A start on it was made about a year ago and more than half is now completed. It is expected that the whole of the masonry work will be finished by next March.

The northern portion of the new main for 19 miles will be composed of steel pipes of 50-inch bore, and the southern portion of cast iron pipes of 48-inch bore. The contract for iron pipes was let to Turner, Hoare & Co., of Bombay, at $752,000, and several thousand tons of them have been delivered and laid. For constructing steel pipes a contract was let to Messrs. Mephan, Ferguson & Sons, of Melbourne, Australia, at $1,058,000 and they are now proceeding in Bombay with their manufacture. The scheme is being carried out with such expedition that the end of next year is considered the probable date of completion.

The total length of the new Tansa main will be about 33 miles, and from the headworks of the water supply at Tansa to the outskirts of Bombay the main will run parallel with the existing chain of pipes which bring water to the city. A journey along the new main to-day will show that good progress is being made. A bed has been prepared over the whole length of the main, and for several miles of this length pipes have been placed in position. If it were not for the fact that more than half of the length of the main will consist of steel pipes which are being manufactured on the scene of the work the new Tansa main would not be invested with more interest than that attached to the laying of any important water conduit.

The manufacture of the steel pipes is carried out in the city of Bombay through an interesting process. The pipes are made in 28-foot lengths or over twice as long as the pipes of which the present main is constructed, and are 50 inches internal diameter. These large pipes are manufactured with a minimum of labor and with the greatest of ease by the very heavy and powerful machinery in local works, in which every labor-saving appliance that the Australian manufacturers could devise has been installed.

To follow one of the large steel sheets which measure 28 feet long and 6 feet 7 inches wide, through the works will illustrate the process of manufacture. The sheet is first lifted from the stack by a hydraulic crane and then passed through a set of rollers to take out any bends or buckles which it may have received in transit. After having been straightened it is passed on to a very large and powerful planing and upsetting machine. The next stage is to bend this 28-foot long sheet to a half circle, and for this purpose a set of rollers specially designed to take this long length of plate are used. The next operation is to join two of these long half circular trough-like sheets together to form a pipe, and this is where the lock-bar joint is used. This joint is made with a rolled steel bar 28 feet

long. To form a pipe the sheets are first clamped firmly together with their thickened edges in the grooves of the lock bars.

The next operation is to close down the lock bars over the thickened edge of the plate, and this is done with a powerful hydraulic press. This press is arranged to close both bars at once, and this result is obtained by having a mandril which supports the pipe inside while a ram comes up from the bottom and squeezes the bars home in the tools or dies shaped specially for this purpose, the top die being supported by the casting of the press. The force exerted by this press is 450 tons at each stroke. The dies are about a foot long, and a few inches only are done at a time, the pipe being moved through the machine till it is completed. The next operation consists of trimming the ends of the pipes, the bars and the sheets not being supplied exactly to length nor exactly square. This is accomplished with a couple of hydraulic shearing machines. The pipe is then ready to be tested before receiving its protective coating. Each pipe is filled with water and tested to 200 pounds per square inch. It is then rolled to and dipped into a steel tank, which is full of a mixture of tar and Trinidad asphaltum, which is kept at a temperature of 350° F. by furnaces which are arranged under it. The pipe is allowed to remain in this bath until it reaches the same temperature as the bath itself, and it is then hauled out and lowered into a revolving frame. While in this frame a strip of hessian cloth is laid on the pipe while it is revolving, the result being that the hessian is wound up on the pipe spirally from end to end.

The next operation is to spread more of the mixture from the tar bath on top of this hessian, thus thoroughly saturating it. A coating of sand is then thrown on the pipe, and while the pipe is cooling any roughness in the coating is smoothed down by the use of hand rollers. When cooled sufficiently for the coating to harden the pipe is rolled away ready to be taken away to be laid and jointed.

In connection with this new Tansa main, the only business which appears to have gone to the United States was the sale of about 40 tons of steel piling by the United States Steel Corporation. This piling was used in connection with the crossing of a small creek.

The Australian company which has obtained the contract for the steel pipes in connection with this main, and which has been enterprising enough to erect its own plant in Bombay for the construction of the same, will, it is anticipated, bid on future work of the same sort in India, and will always hereafter be an important factor in the international competition here in steel piping. As it receives over $1,000,000 for the pipes supplied, it apparently paid well to erect the local plant.

PUBLIC WORKS

F. M. S. Public Work.—Provision has been made in the estimates for all manner of public works, such as new roads, new bridges, waterworks, public offices, a new Malay Training College, schools, hospitals, and a State mosque at Kuala Kangsar of great architectural beauty as a lasting memorial of the reign of His Highness the Sultan of Perak.

Tientsin, New Bund.—The Chinese Maritime Customs Administration has decided to construct at Tientsin a bund of reinforced concrete in front of the customs house similar to that of the French bund. This improvement will have about 200 feet frontage, and the contract has been secured by the Syndikat Industriel et Commercial.

New Road for Amur Gold Region.—From 1910 to 1913 surveys were made for 14,033 miles of roads. The Department of Ways and Communications is working on a project for the construction of a wheel road from the village of Yakutskaia Stayba, on the Selemdja River, to Kerbinsky storehouse, on the Amgun River, a distance of 317 miles. The section to be served is the gold region of Amur Province.

The Selemdjinsky, Niman-Burea, and Amgun-Kerbinsky gold mines are the only active industries in the northwest part of Amur Province in an area of 26,400 square miles. At present these centers are connected with city centers by pack trail only, and every spring and autumn the connection is broken for two months. The construction of the new road, which will cost about $2,381,000, will keep communication open all the year.

New Antung Customs Shed.—A shed has been erected on the bund at Antung for temporary storage of cargo awaiting customs examination. Its cost was $2,875, which will be recovered by a charge of 25 cents per boat load or part thereof stored therein for a maximum of four days. A boat load is calculated on a basis of 40 tons measurement (1,600 cubic feet). When the cost of construction shall have been recovered the storage charge will be reduced to a rate sufficient to keep the shed in good repair.

This shed is not considered by the authorities as a godown (warehouse), and all goods are stored there entirely at the owner's risk.

Road and Bridge Work in the Philippines.—The Secretary of Commerce and Police has set aside $79,000 for bridge and road work throughout the islands under the provisions of act No. 2378 of the Philippine Legislature, which appropriates money for provincial public works on the condition that the various Provinces raise a proportionate part of the funds necessary, as follows: For Bayambang Bridge on the condition that the municipality of Bayambang contribute enough to complete the bridge, $12,500; for the Pagsanhan Bridge on condition that the Manila Railway Co. contribute $5,000 and the steel superstructure and that the municipality of Pagsanhan contribute enough funds to complete the bridge, $9,000; for the Balos Bridge on condition that the municipality of Iriga contribute enough funds to finish the bridge, $500; for bridges and culverts on the Niac-Indang road, $7,500; for bridges and culverts of the Nasugbu-Thy road, $12,500; for experiments with road materials by Bureau of Public Works, $9,000; for maintenance of Manila south road, $10,000; for Manila north road maintenance, $10,000; for maintenance of Bobonan-Camp 1 road, $2,500; for maintenance of Bangar-Tagudin road, $2,500.

Hongkong, Extension of the City.—A development scheme for the south side of the island of Hongkong, now before the legislative council, if carried into effect, will increase the available building area by about 200 acres and also the total tidal area between Aberdeen, Little Hongkong, and Brick Hill. The south side of the island is considered by far the coolest, and the only objection to its development has been the great cost of furnishing transportation. The population has outgrown the present limits of the city of Victoria, and the necessity of providing for immediate needs and the future has prompted the promoters to present the scheme to the Government.

On the harbor side of the island the available space for building has about been exhausted and the cost of construction has become almost prohibitive. In the Peak district the cost of building is so great that little attempt has been made to occupy the few good sites left. In Kowloon building has gone on apace in the past three years and practically all of the best sites have been covered with buildings. This scheme is designed as a partial solution of the housing problem, rents having gone up enormously within the past few years.

The Government will be obliged to spend considerable money in making the section under review inhabitable, but the nature of the land should render the work comparatively easy, if expensive. The promoters seek the sole right for 25 years to supply electricity and gas within the areas over which they have an option and also the right for the same term to run public motor cars. The Government proposes to extend the present highway from Aberdeen to Deep Water Bay, and other extensions are under consideration which will open up sections now useless because of lack of roads.

Among the chief points of the provisional agreement entered into between the Government and Dennys & Bowley, solicitors, are that should the Government approve the scheme the promotors must begin actual construction of the tramway or light railroad within one year from the date of the ordinance, and one or the other must be completed within three years. If the promoters fail to comply, the concession is forfeited. The Crown leases of the areas taken up shall be granted for 75 years, renewable for a similar period at a reassessed Crown rent. Final action of the legislative council will not be taken for some weeks.

Taiwan Public Works.—The principal public works in Taiwan, apart from harbor improvements, consist of the construction of power stations and irrigation works in Ako Prefecture, south Taiwan. Waterworks costing $55,950 were constructed at Tainan and will be continued in 1914, when it is expected this work will cost $239,000. A wall to protect the city of Taihoku from the disastrous floods that accompany typhoons when the Tansui River overflows and floods the city for a distance of over half a mile, is under construction along the east or right bank of the river and is already about half completed. The work done in 1913 cost $151,227, and it is planned to spend $161,500 in 1914. Protection walls were also built along the Dakusui River in Nanto Prefecture (south).

Singapore, Incinerating Plant.—Projects undertaken and completed by the municipality during 1913 included the completion and setting into operation of the new municipal incinerating plant at a cost of $127,000 to $136,000. The installation of the new sewerage system was begun, but the work is being carried on rather slowly. Part of the work has been sufficiently completed to allow the operation of a part of the system.

Harbin, Municipal Construction Work.—The Town Council of Harbin proposes to make a long-term loan of $2,729,500 for carrying out the following undertakings: Construction of waterworks and canals, an electric street car system, electric lighting system for the municipality, construction of a telephone line, construction of a municipal administration building, school building, hospital, veterinary hospital, a fire department, a refrigerating plant, stock yards, public park, and the reconstruction of the summer theater.

The following are the estimated amounts required: Electric tramway system and electric lighting plant, $668,750; city telephone, $125,000; market in the new town, $95,000; town schools, $167,000; municipal administration buildings, $85,500; repairing the river bank, $15,000; sanitation yard, $5,000; municipal hospital, $91,500; veterinary hospital, $20,000; fire department, premises for, $48,000; establishment of a new fire department, $20,000; fire alarms, $7,500. To this amount must be added: Municipal debts, $150,000; loss of interest during construction, $150,000; other constructions, $50,000.

Taking into consideration the loss by exchange, about $252,000, or 13 per cent., the amount of the loan required will be $1,950,000. The town council has received an offer from Gardin, Weg & Co., a banking house, whose proposal is to furnish $1,520,000 for 50 years,

at 5 per cent. interest, the issue being at 87½; the entire amount of the loan to be paid at one time, or 87 per cent. to be paid in installments covering a period not longer than 18 months. The security for the loan is the guaranty of the Chinese Eastern Railway, to be approved by the Russian Minister of Finance.

The following table shows the estimated costs, revenues, and expenditures of the various enterprises and constructions in question:

Undertakings.	Cost	Gross revenue.	Expenditures *a*	Difference, *a*
	$668,750	$154,500	$130,300	*b*$24,000
Tramway and electric plant	125,000	50,000	41,500	*b* 8,500
Telephone	95,000	16,875	8,580	*b* 8,295
Market	85,500	12,970	10,512	*b* 2,458
Municipal administration building	167,000	9,600	10,688	1,088
Municipal schools	15,000	1,586	960	*b* 626
Repairing river bank	5,000	781	670	*b* 111
Sanitation yard	82,500	.....	5,280	5,280
Municipal hospital	9,000	.....	1,386	1,386
Municipal hospital equipment ..	20,000	750	2,080	1,330
Veterinary hospital	48,000	.....	3,072	3,972
Premises for the fire department..	20,000	.....	2,080	2,080
Fire department..	7,500	.....	780	780
Fire alarms	150,000	9,000	9,600	*b* 300
Payment of short-term loans ..	150,000	.....	9,600	9,600
Loss of interest during construction	50,000	.....	3,200	3,200
Other constructions	1,698,250	256,962	240,488	72,106
Total	.....	.....	.....	44,290
Less net revenue	.....	.....	.....	27,816
Net expenditure				

a Including 5.4 per cent. interest on the capital and amortization of capital, with interest.

b Net revenue.

The secretary of the town council states that, upon the receipt of a satisfactory proposal, the municipality is willing to offer the above-listed undertakings and buildings as security.

MINING

Gold in Japan.—It is reported that a gold mine with a number of rich veins has been discovered in the basin of a little tributary of the river Nochibetsu in Iburi province. The deposits are said to be worth more than Y.150,000,000, the ore found containing gold at the rate of 5/100,000.

Kailan Mining Administration.—The total output of the Administration's mines for the week ended September 19 amounted to 44,305.25 tons and the sales during the same period to 43,510.51 tons.

Week ended September 26, output 45,574.08 tons, sales 47,573.01 tons.

Week ended October 3, output 45,400.58 tons, asles 56,366.59 tons.

Week ended October 10, output 45,107.52 tons, sales 47,714.81 tons.

Japan, Zinc Refining for Export.—The zinc refining industry in Japan is making continued progress. Two companies produce 400 tons a month and are now more than able to supply the home demand—about 300 tons monthly. Hence Japan is about to become a zinc exporter. The price has declined to $6.90 and $7.50 per picul (133⅓ pounds), a drop of 35 to 40 cents from January, 1913.

Philippines, Oil Indications.—It is reported that a rich oil deposit has been found at Toledo, Cebu. Some 450 gallons of the crude oil are said to have been taken, which under analysis proved of good quality. A $250,000 company is being formed to develop the deposit. Other companies are being formed to explore adjoining land. Machinery for the well has been ordered from Europe.

Oil in Sarawak.—One can gather very little information at this distance regarding the Miri, Sarawak, oil field. The following extract from the yearly report of the Resident of Miri, meager as it is, may, however, prove of interest: Information concerning the progress of the Anglo-Saxon Petroleum Co. has been received. The European section of the staff at the end of 1913 numbered 28, as compared with 21 at the end of 1912, and Chinese and other clerks 15, as compared with 7 the previous year; these numbers will be added to at an early date. Six additional wells were brought into production during the year, two having been drilled for water supply. Drilling is in progress in four more wells, while four others are being gotten ready. Eight drillers are employed.

The daily production has increased more than four times, compared with the best results obtained in 1912.

Shipping of crude oil for refining commenced in April last and at present shipping arrangements are just keeping pace with production.

New Coal-Mining Method in China.—The management of Fushun collieries started on April 6 the excavation of an open cast at Kuchentzu, Manchuria, where the coal seam is accessible at only 24 feet under ground. The seam was reached on May 28. This part of the seam may have once been beneath the river bed of the Hun. The quality of the coal on the surface was found to be rather indifferent, but deeper down an improvement in quality is expected. At the outset, an area of about 180,000 square feet is to be cleared of the earth, etc., over the coal seam. The clearings are estimated to be about 720,000 cubic feet, and a gang of about 1,000 coolies is now kept at work for the removal of the earth, etc. Steam shovels will be used in commencing mining operations. The mining area will be extended gradually westward. This mining method has been resorted to with the object of meeting a shortage in supply which will be experienced as a sequel to the execution of the sand-flushing plan in the existing shafts and pits.

Iron Furnaces, Korea.—A new pig-iron furnace is to be erected by the Mitsu Bishi Co., at Kenjiho, near Pyeng Yang, within the next two years at an estimated cost of 5,500,000 yen ($2,750,000). It is understood that bids have been invited from various companies in England, the United States, and Germany: It is planned to erect two pig-iron furnaces, with a capacity of 150 tons each per day. The product is to go mainly to the steel works at Wakamatsu to replace the pig iron now being imported from China. The company owns both coal and iron mines in the vicinity of the proposed foundry, the iron ore from which is said to be very similar to the ore found in the Alabama mines in the United States. The men in charge of this work are supposed to favor European manufacturers, but, as the furnaces for treating the Alabama ore are of a peculiar type, it would seem that American manufacturers would be better qualified than those in Europe to produce furnaces for the Kenjiho works.

Tungsten Mines in Korea.—During the last calendar year operations were commenced in the tungsten mines discovered in the eastern part of Chosen. An average of 5 tons per month, it is reported, was shipped to Yokohama, the estimated value being $400 per ton. Numerous applications are being received for permission to work similar mines in the same section of the country. However, owing to the general scarcity of tungsten and to the probable need of such supplies as exist for the development of the iron industry in Chosen, it is reported that the authorities are at present not granting permits for such mines.

Indian Coal Output.—The chief inspector of mines in India reports the output of coal in British India during 1913 as 15,486,318 tons from the following districts: Bengal, 4,649,852; Behar and Orissa, 10,226,389; Punjab, 51,040; Assam, 270,364; Baluchistan, 52,932; Central Provinces, 235,651; Northwest Provinces, 90. In addition 600,000 tons were imported. Exports were 3,000,000 tons, leaving about 13,000,000 tons consumed in India, of which the railways took 4,500,000 tons.

Siam, Tin-Mining.—The Bangkok press reports the formation of the Nai Sok Tin Mining Co. (Ltd.), capital $55,500, which is being registered according to Siamese law. The property is in the district of Langsuen in the Siamese Malay States, and consists of 41 acres, on a hill 8 miles long and 1 mile wide.

Gold in Chosen (Korea).—The greater part of the gold bullion produced in Chosen is exported to Osaka through the agency of the Bank of Chosen for minting by the Government Mint there. The quantity of gold bullion thus disposed of is generally on the increase. To be more particular, during 1910 gold bullion 1,590 *kwan* 676.30 *momme* in weight (1 *kwan* =100 *momme*: 1 *momme*=1325 ounces) was exported and made into coins valued at 7,593,381.50 *yen*. It decreased the following year to 1,561 *kwan* 657.79 *momme*, which was made into coins valued at 7,808,288.95 *yen*, and further decreased in 1912, to 1,448 *kwan* 780.21 *momme*, valued at 7,233,828.85 *yen*. In 1913, however, it increased to 1,740 *kwan* 248.57 *momme*, and minted into coins valued at 8,700,952.85 *yen*.

As for the present year, up to June last 890 *kwan* 121.55 *momme* of gold was gathered and sent to Osaka, and 4,450,607.75 *yen* worth of coins minted from it.

Generally speaking, a greater quantity of gold is gathered in Chosen in the six months ending December than in the six months preceding. This is principally due to the weather. As above mentioned, during 1911, and 1912, the output showed some decrease, but this was of a purely temporary nature, being an outcome of a flood which greatly hindered the work of miners, and so decreased the output at Wonsan and Suan gold mines, the two large gold mines in Chosen.

In 1911, an improvement was introduced in the method of refining, and this increased the quantity of gold for use. In 1912, gold mines at Changsong, Wonsan, and Songya in North Pyongando had either new machinery installed or enlargements made. Along with this, several mining magnates in Japan, including Mr. Furukawa, Mr. Yasukawa and Mr. Fujita acquired the concession of working gold mines in Chosen and steadily began exploitation of them.

With the beginning of 1913, Unsan, Suan and Changsong gold mines showed a substantial increase in output, and by the end of the latter six months, the output broke the record hitherto maintained, with some 900 *kwan* valued at 5,000,000 *yen*. During the first six months of this year, the total quantity of gold sent to Osaka from Chosen surpassed the quantity hitherto sent during the corresponding period, the increase being some 68 *kwan* valued at 341,600 *yen*.

As lately reported, work on the gold mines at Sangju, Wiju and Sinheung was commenced some time ago, under the direct management of the Government. Some more mines are also either being prospected or worked. Under the circumstances, it is scarcely open to doubt that the output of gold in the peninsula will gradually increase.

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